

# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

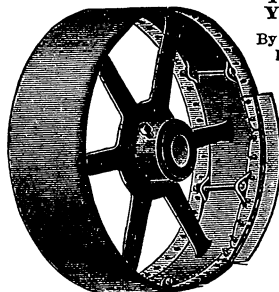
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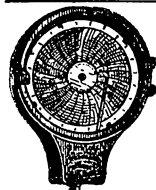
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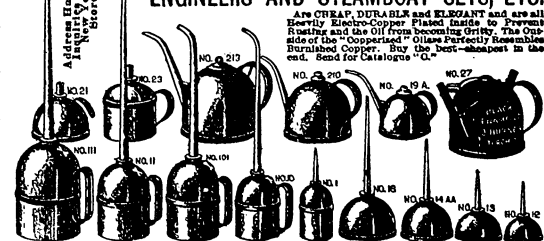
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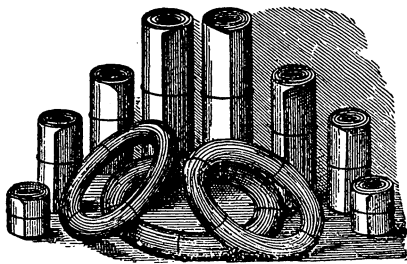
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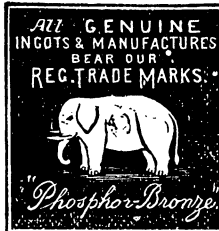
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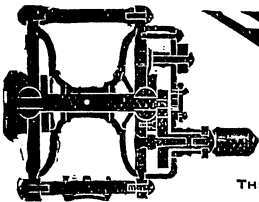
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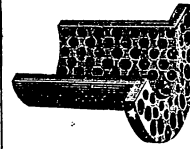
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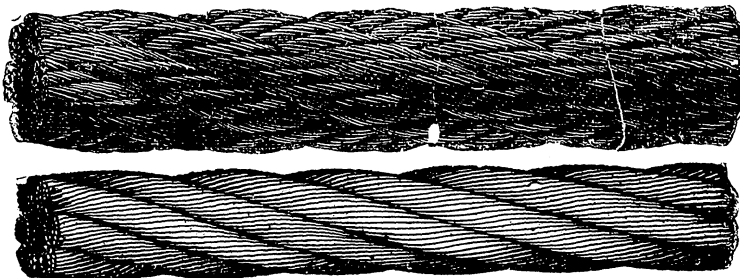
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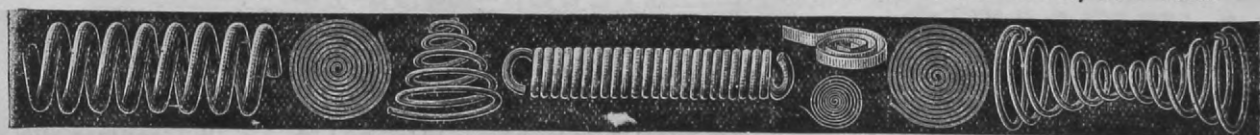
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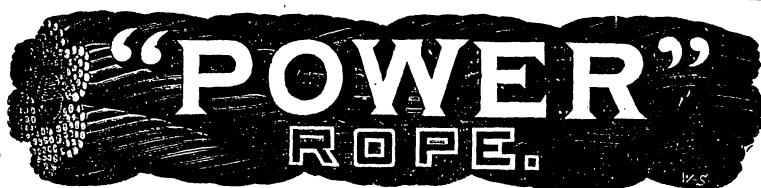
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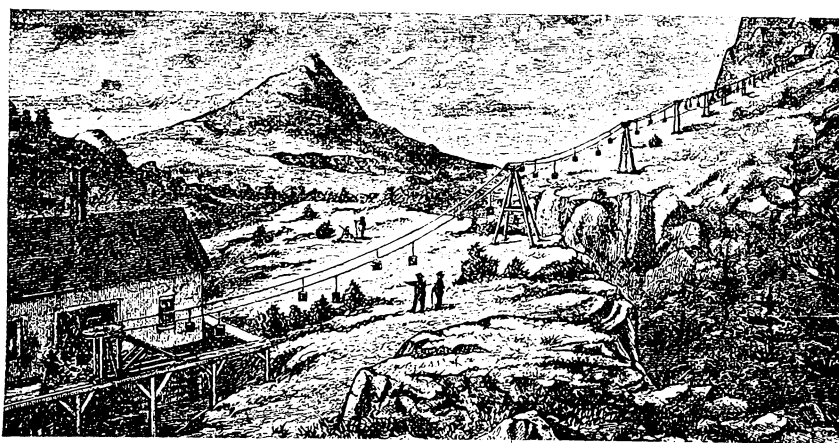
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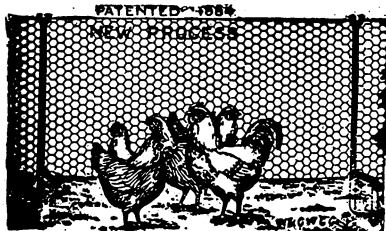
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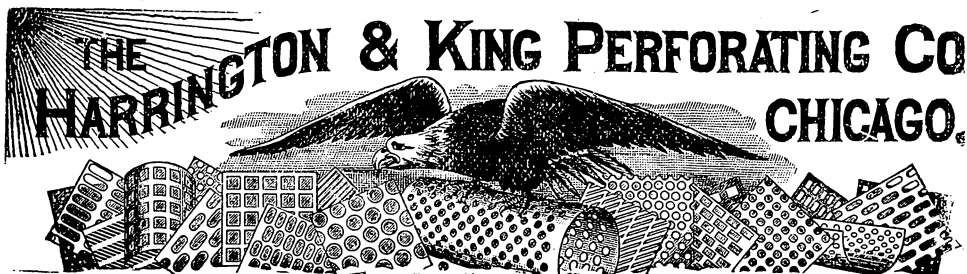
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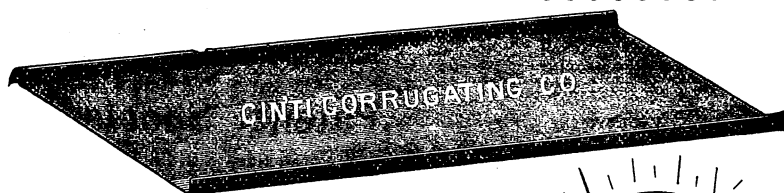
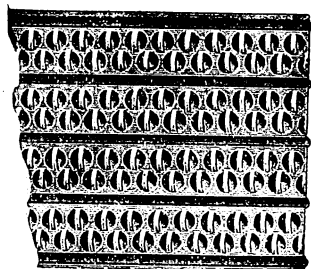
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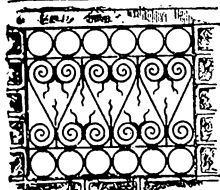
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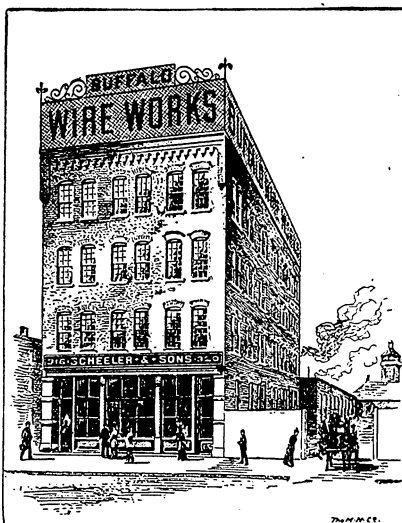
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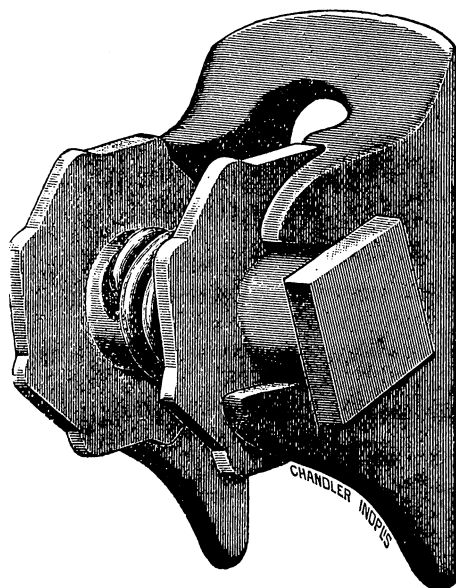
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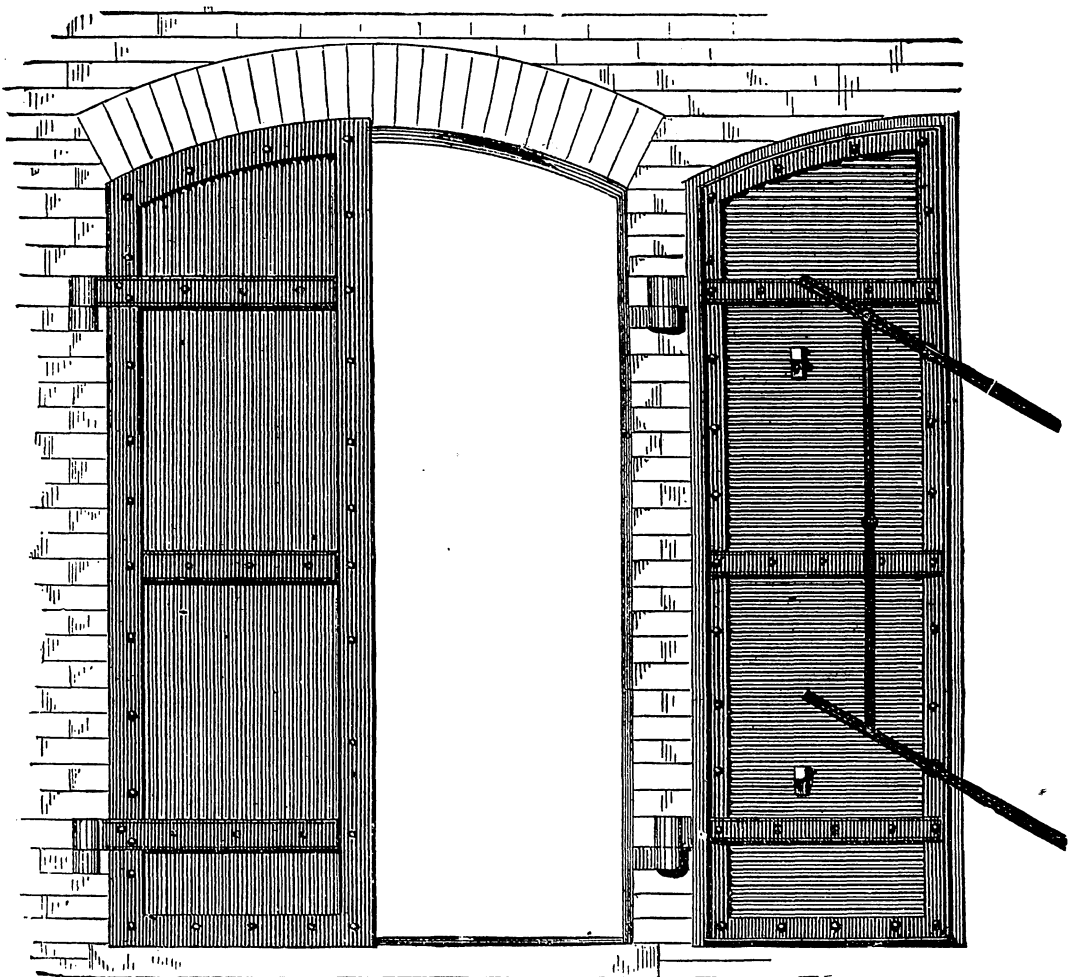
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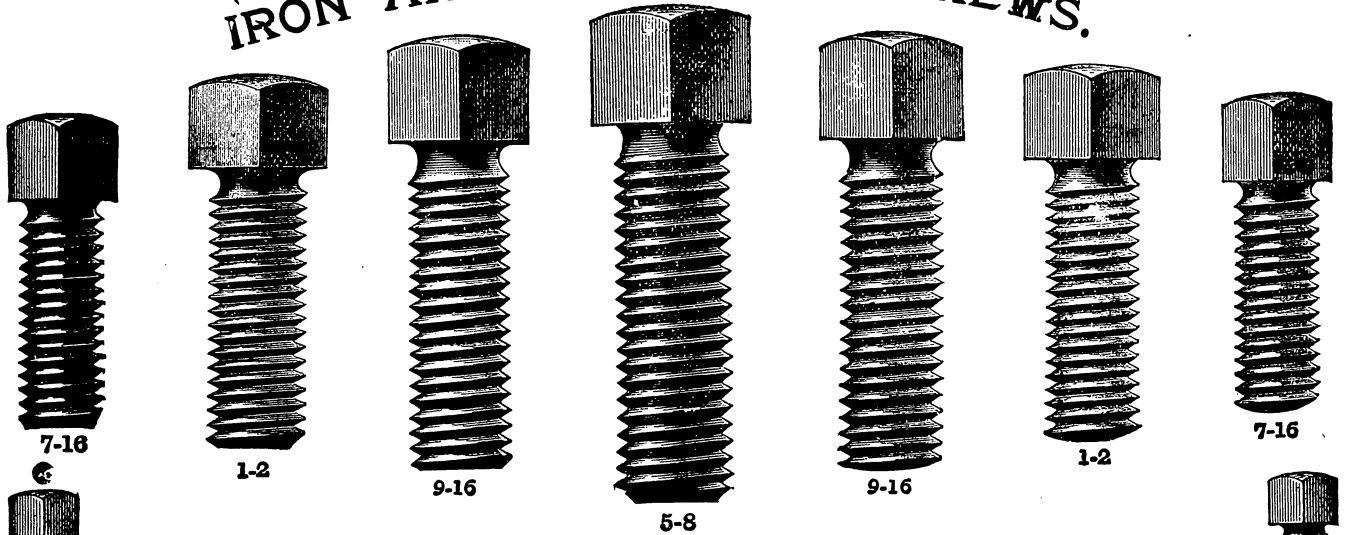
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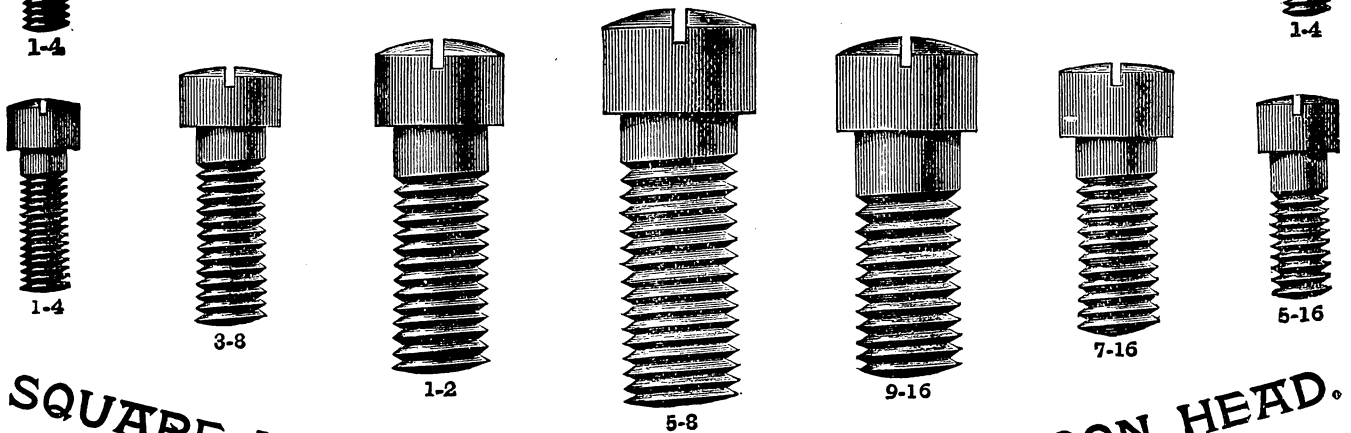
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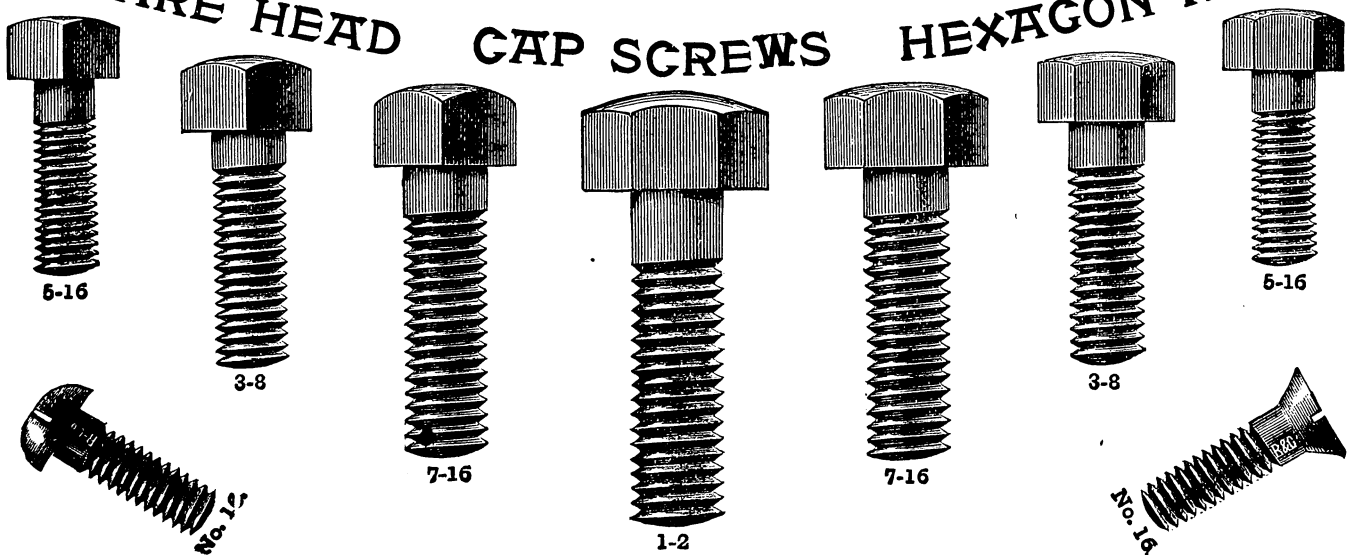
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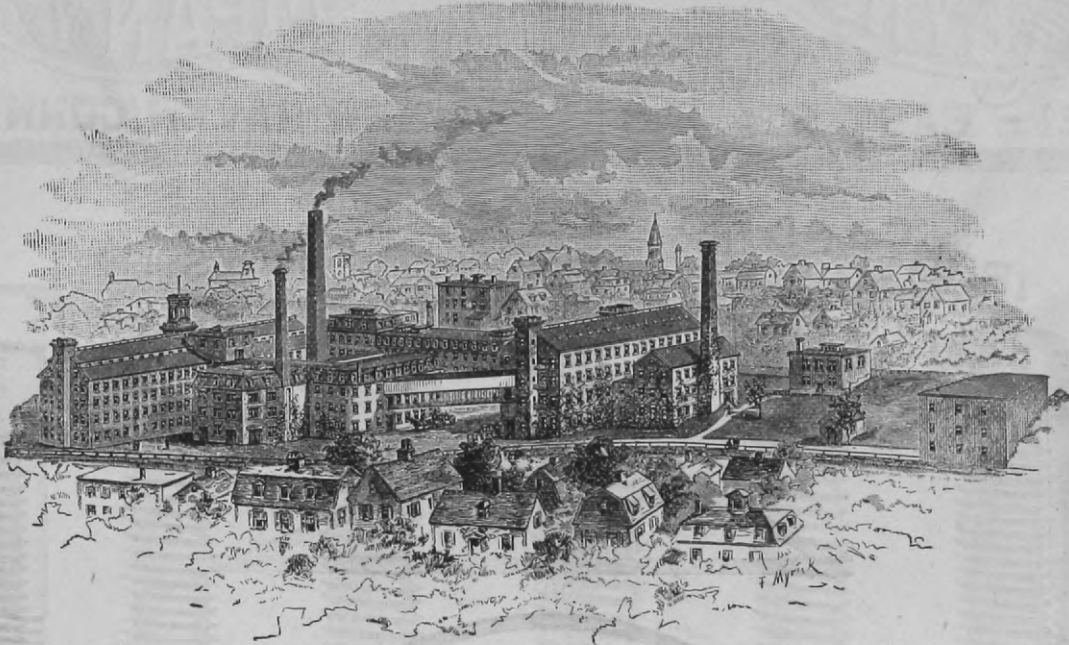
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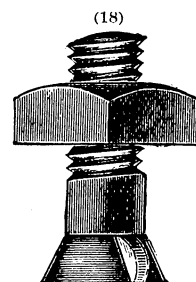
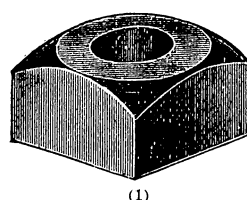
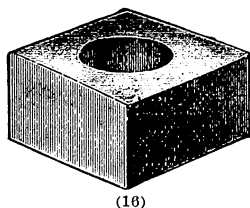
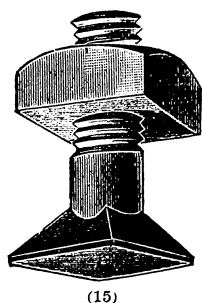
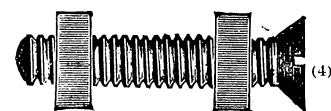
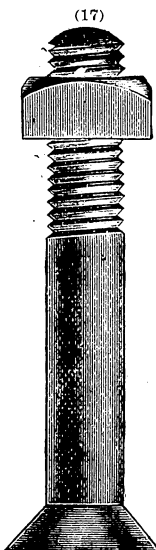
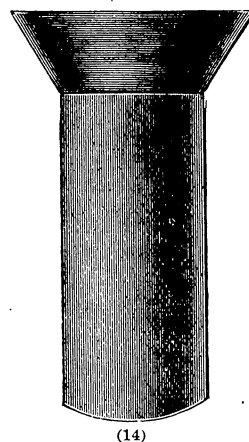
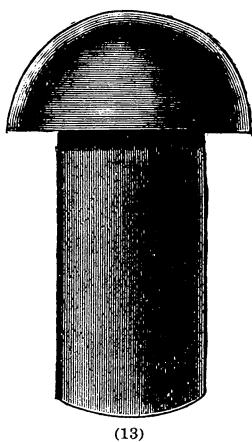
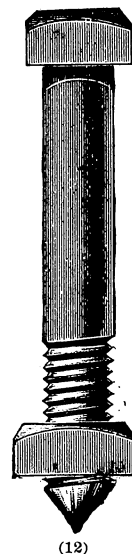
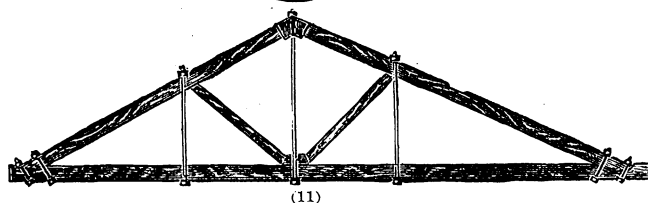
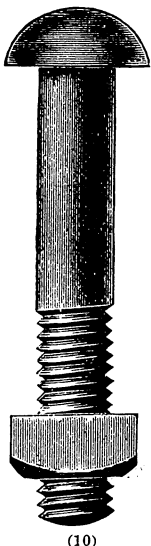
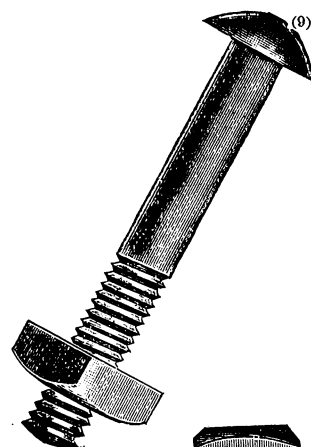
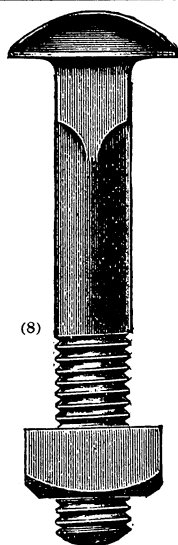
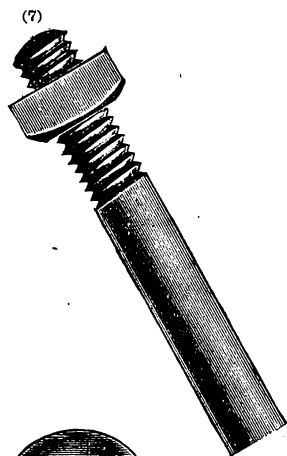
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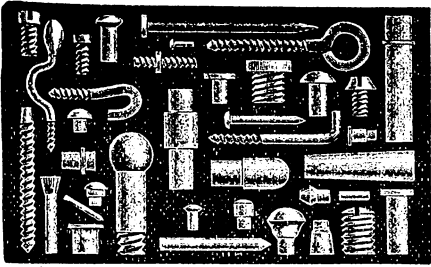
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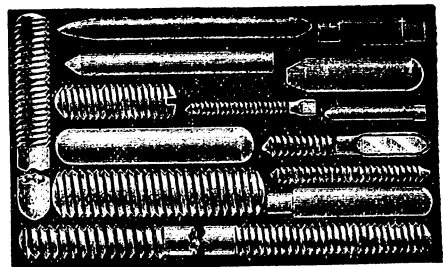
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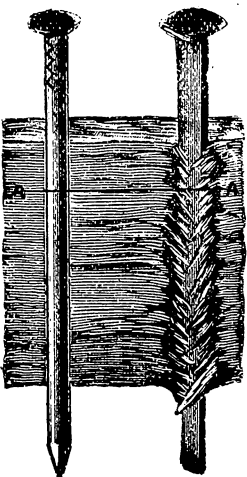
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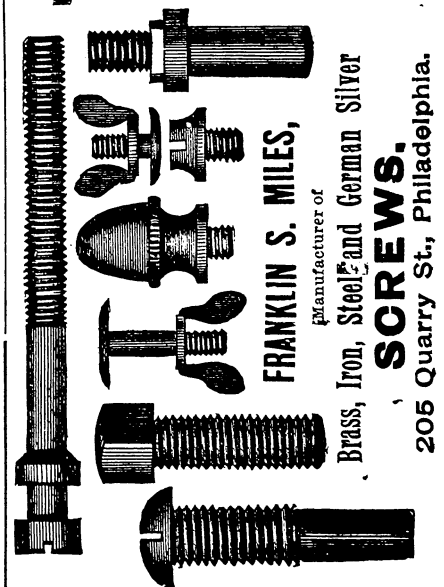
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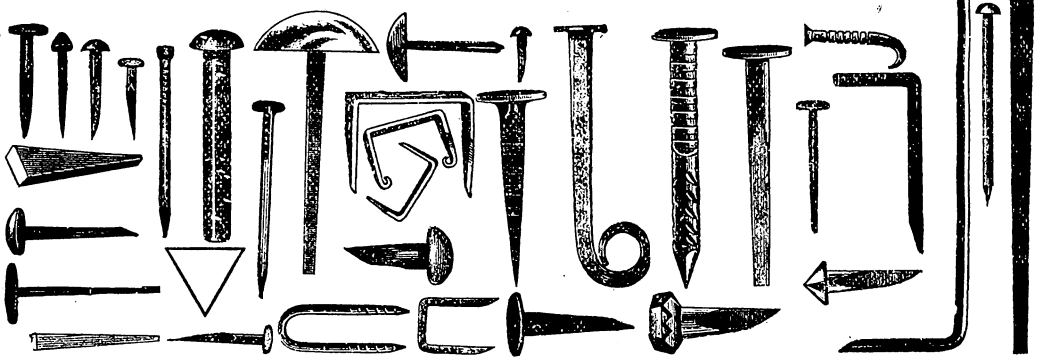
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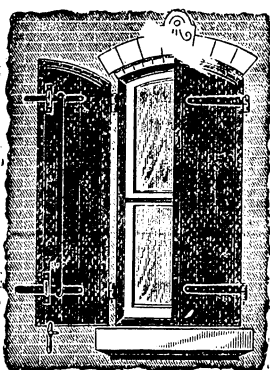
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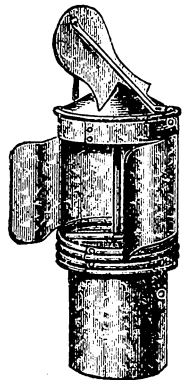
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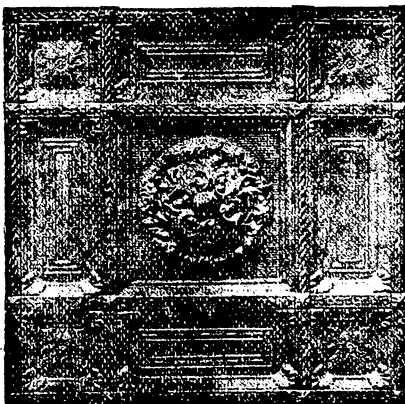
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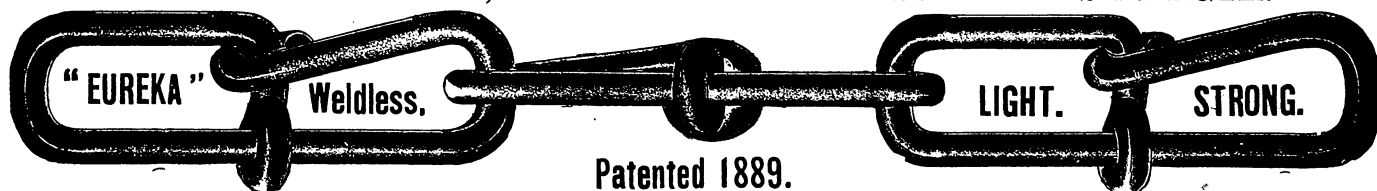
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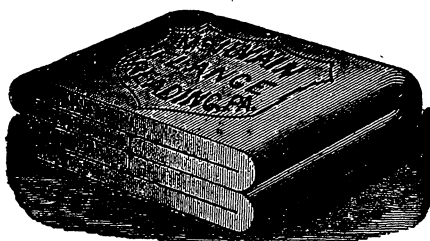
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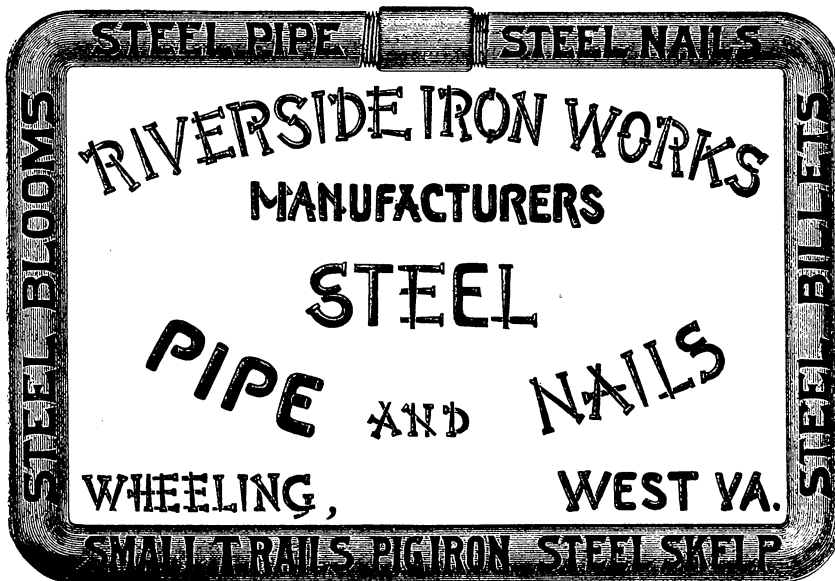
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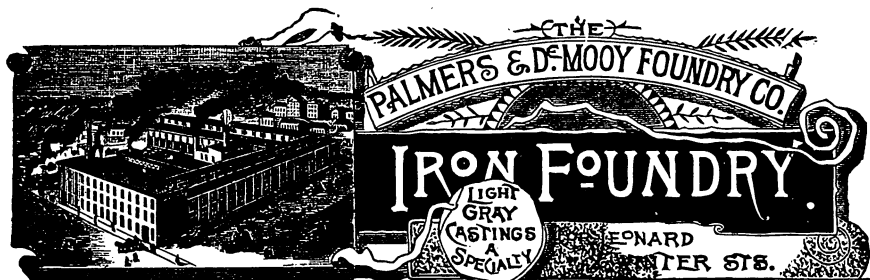
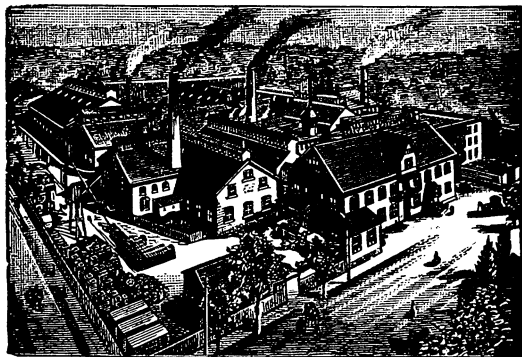
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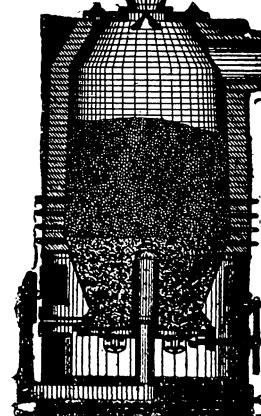
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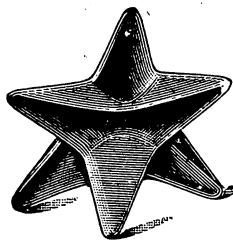
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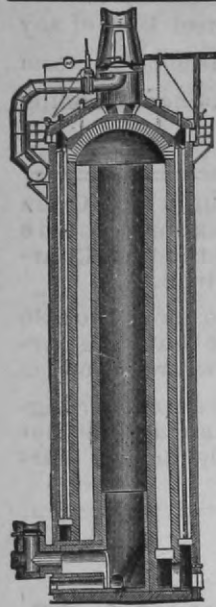
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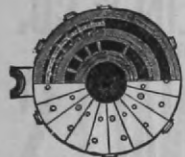
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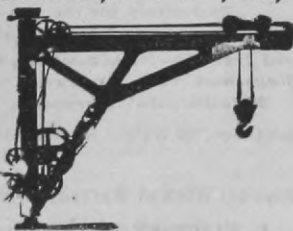
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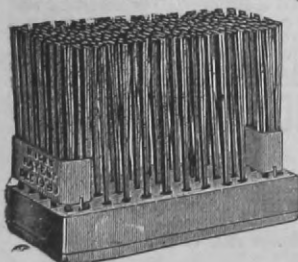
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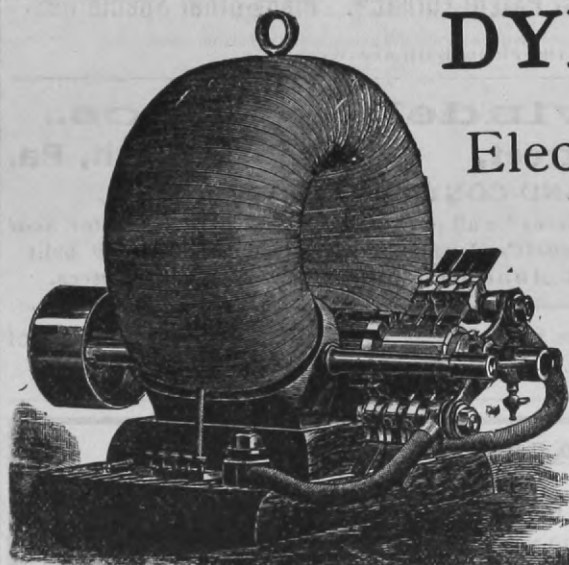
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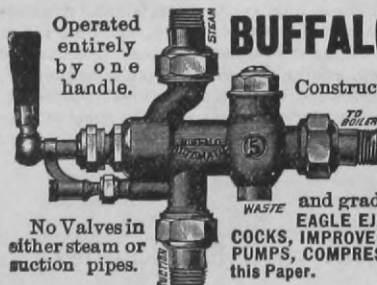


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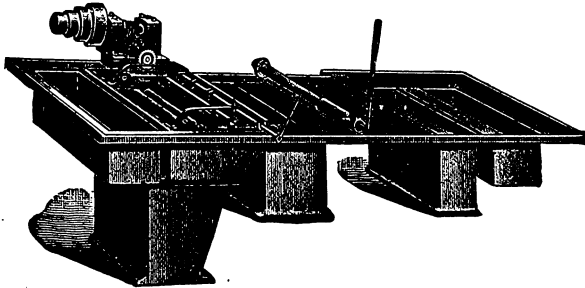


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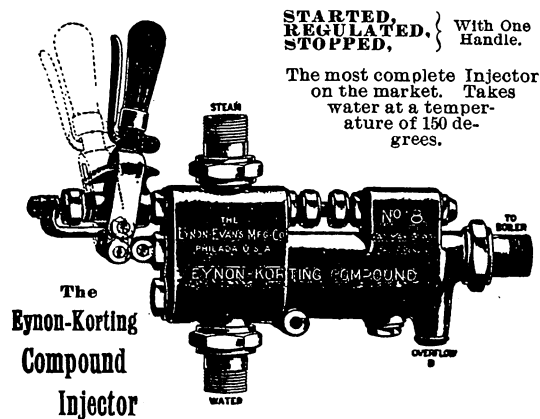
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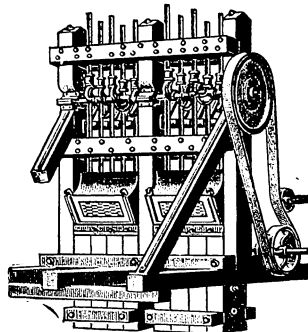
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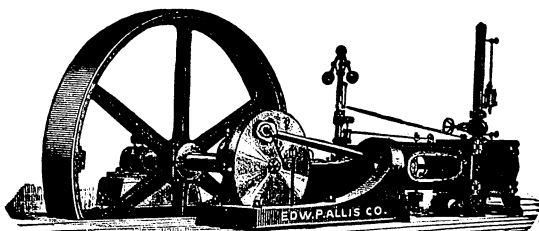
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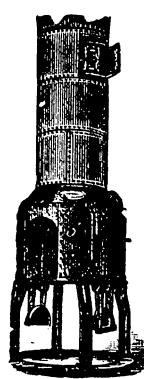
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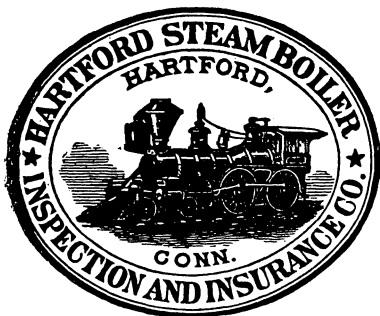
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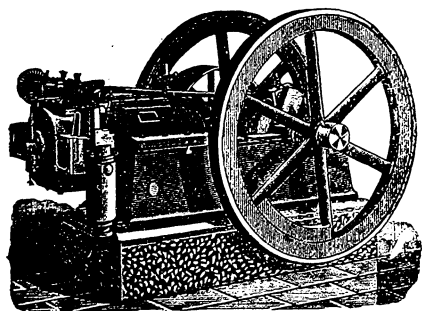
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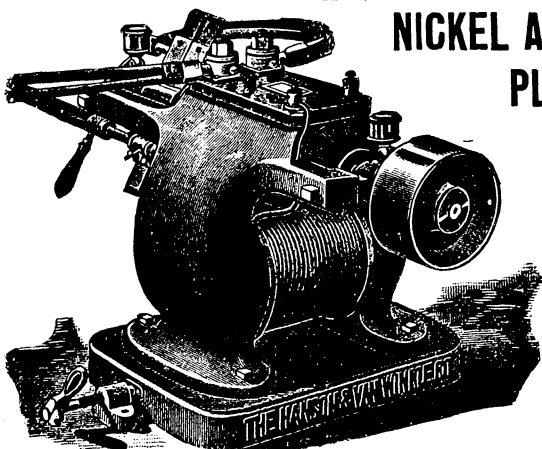
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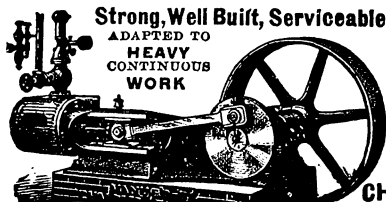
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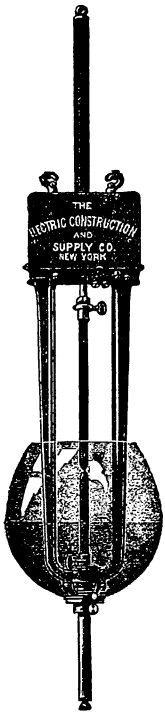
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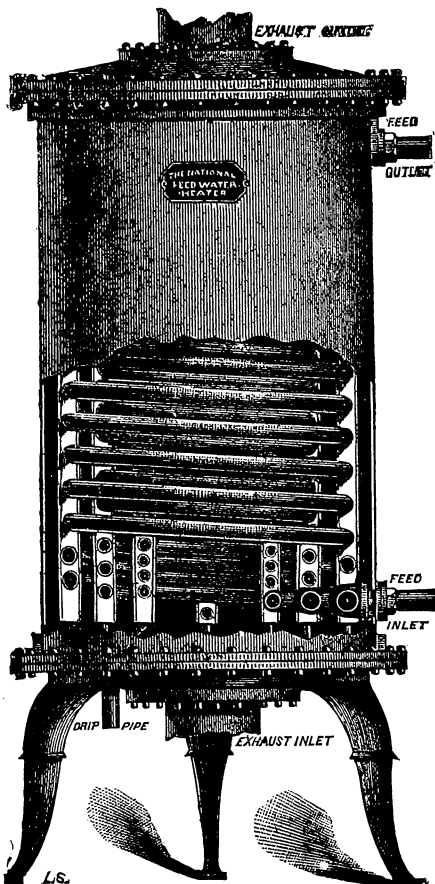
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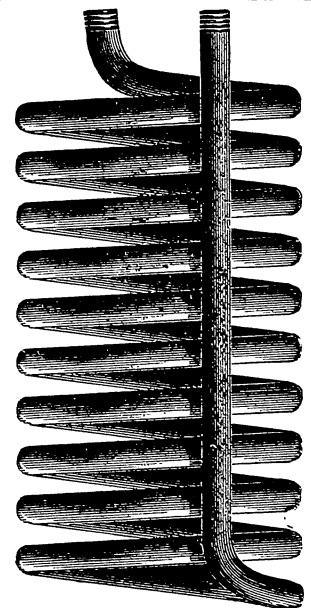
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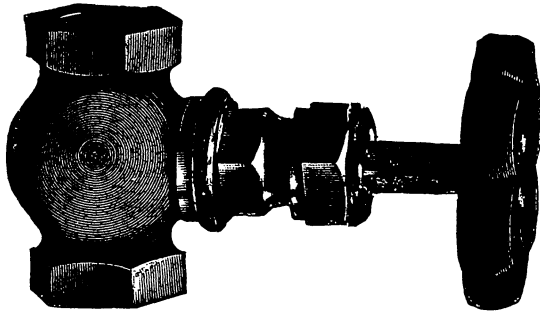


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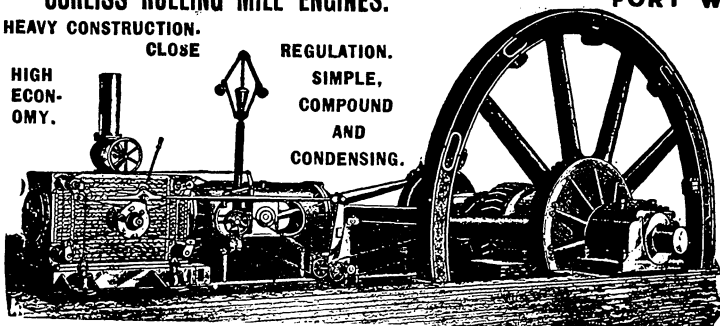
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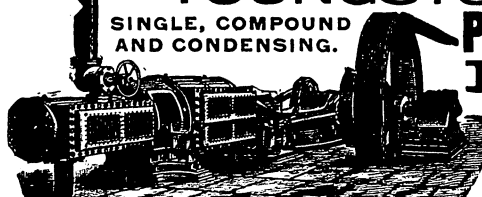


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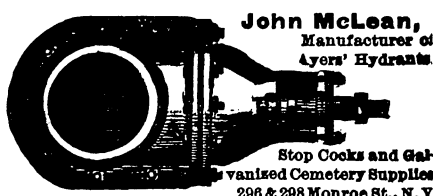
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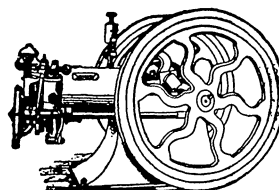
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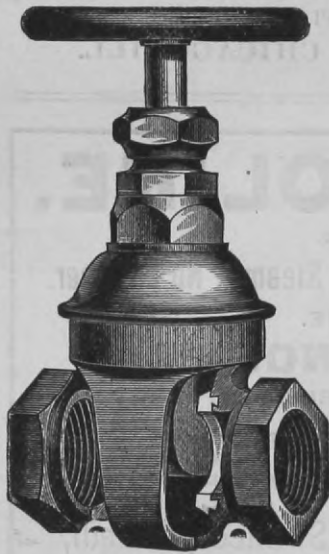
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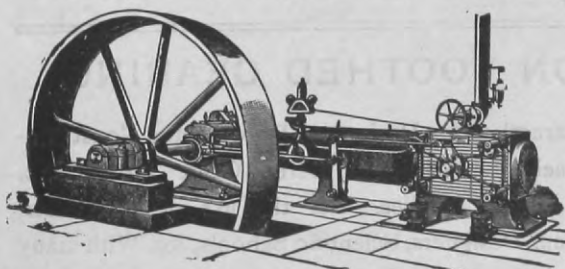
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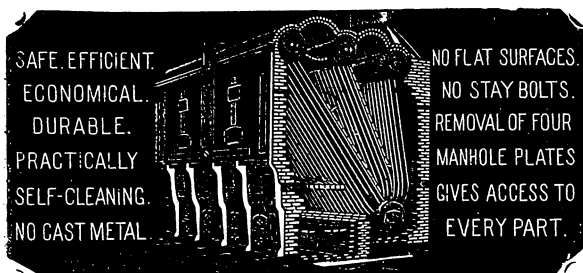
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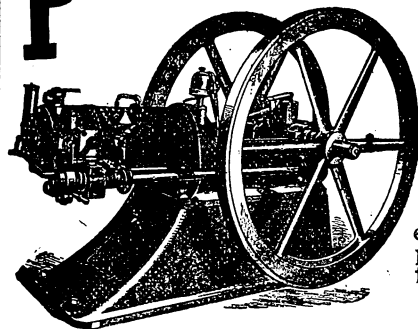


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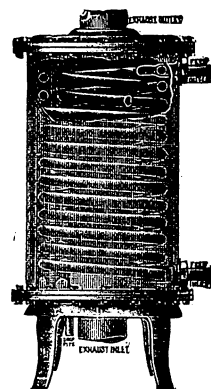
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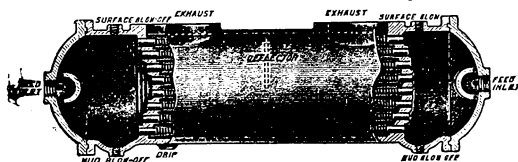
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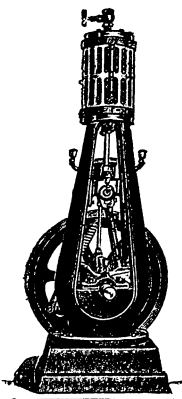
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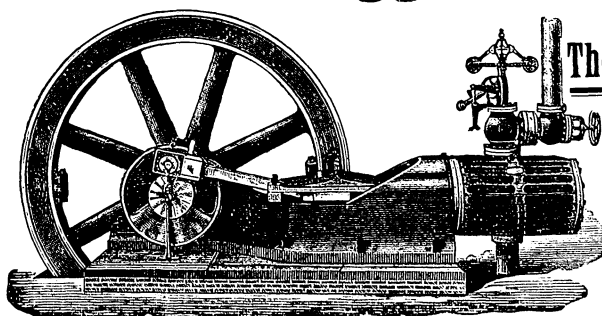
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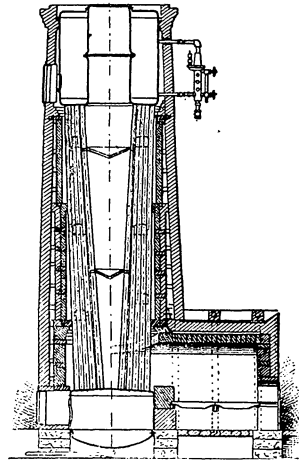


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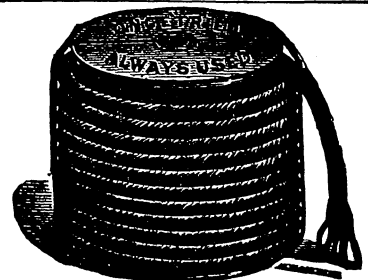
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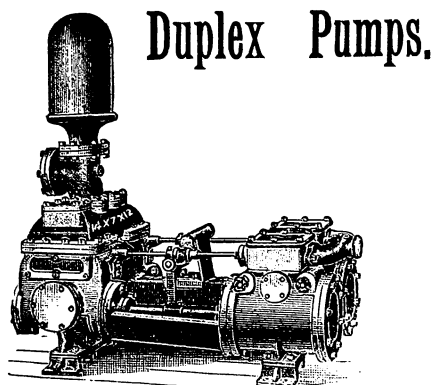


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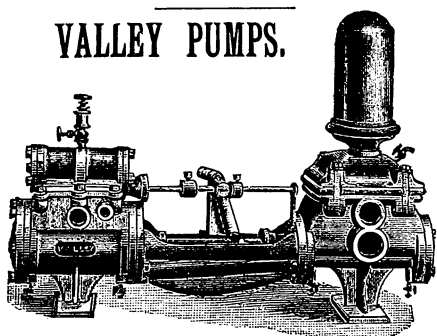


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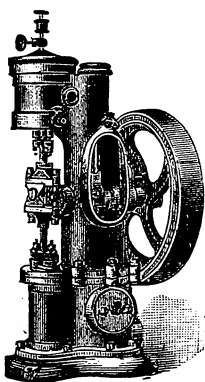




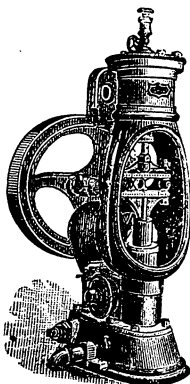
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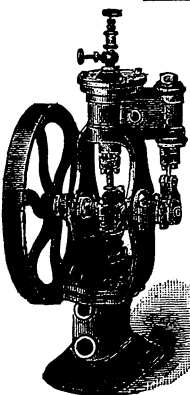
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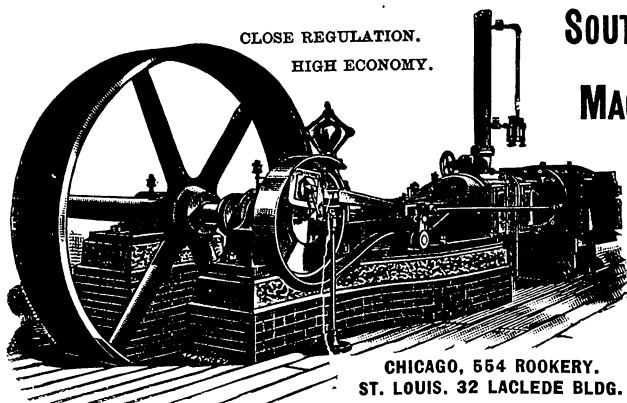
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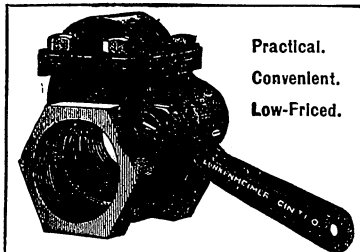
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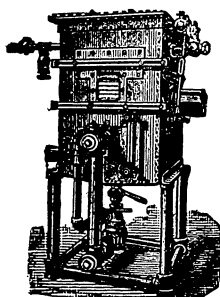
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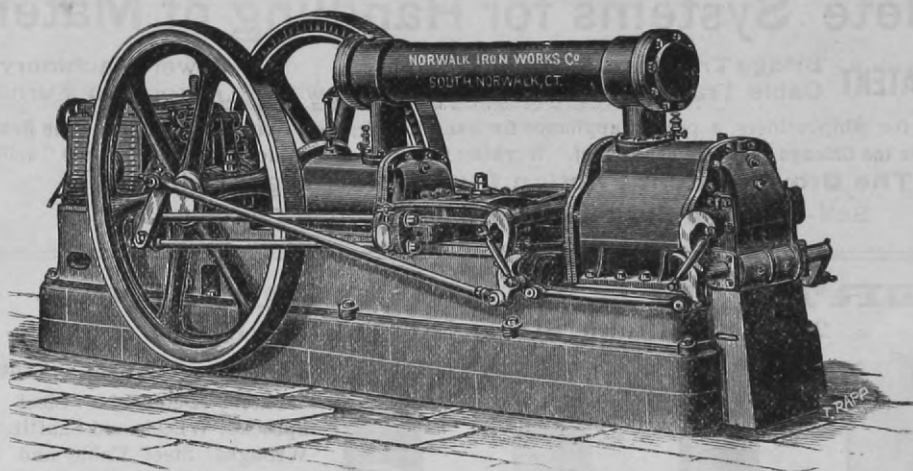
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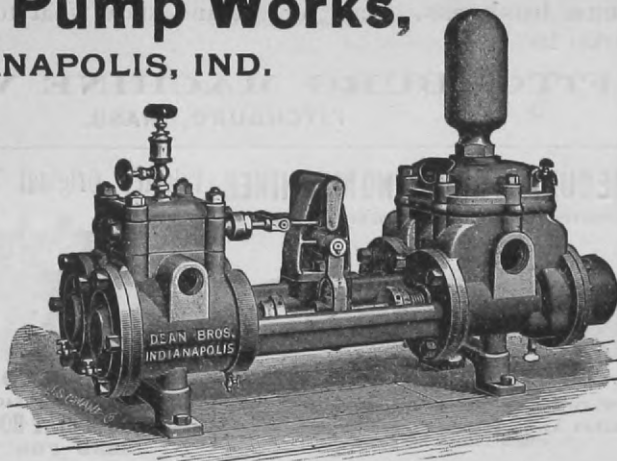
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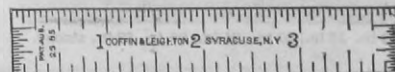
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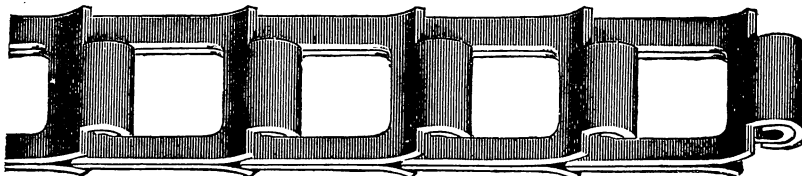
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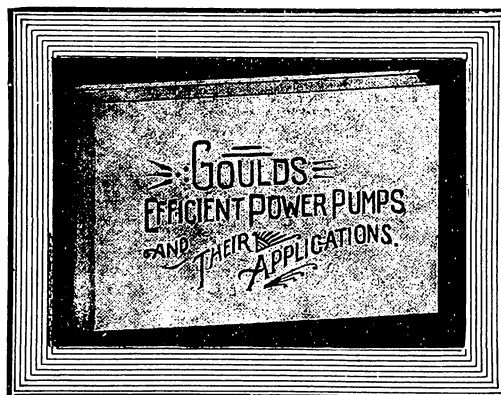


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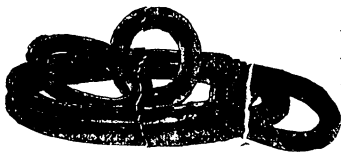
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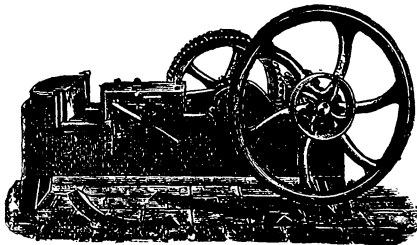
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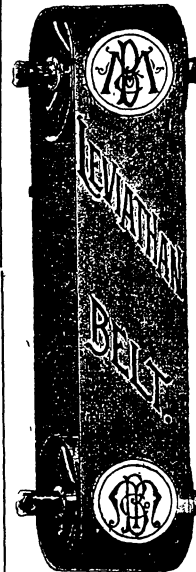
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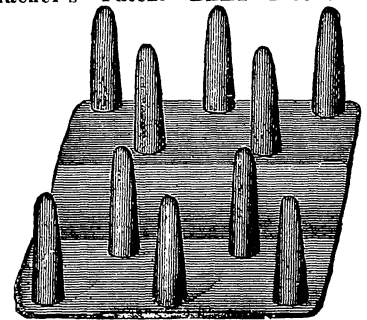
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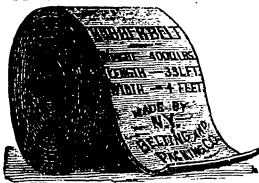
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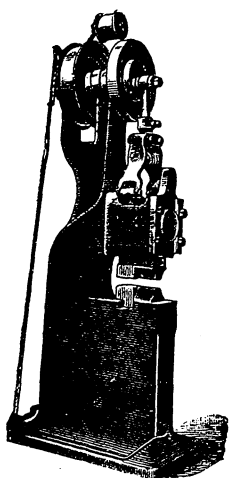
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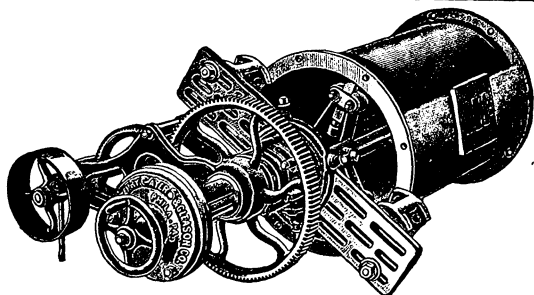


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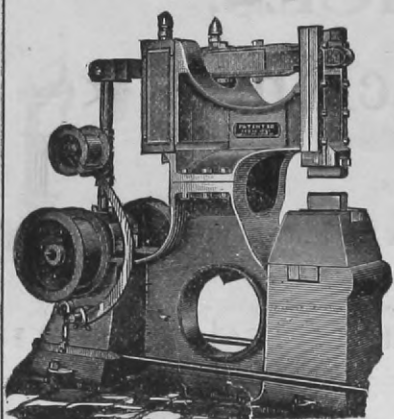
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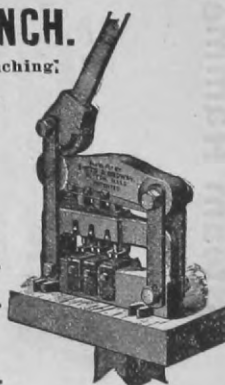
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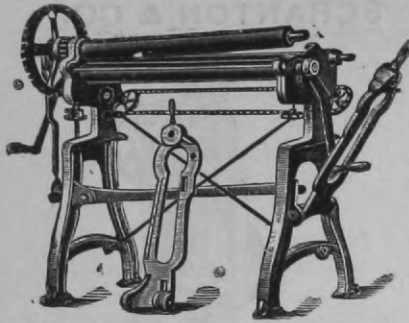


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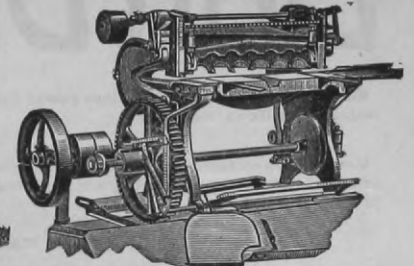
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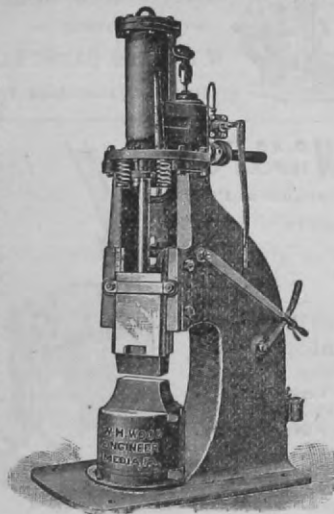
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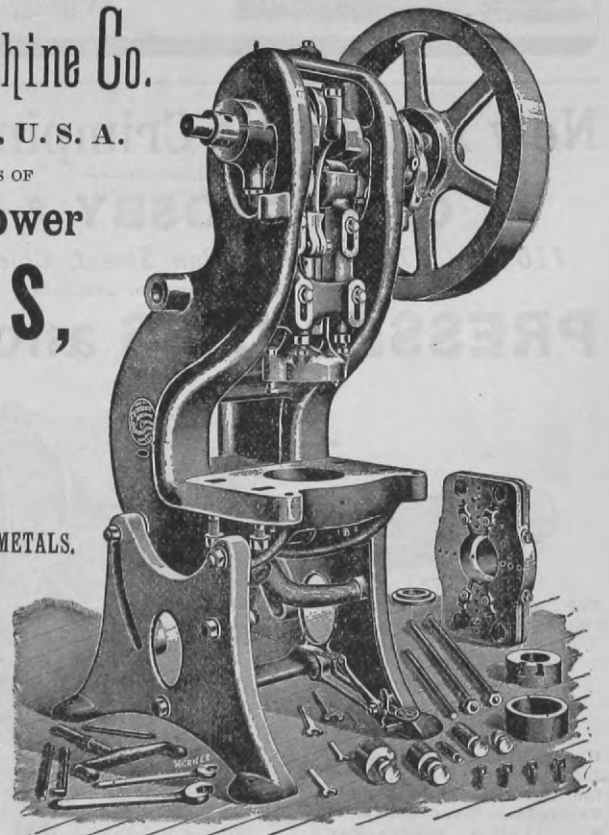
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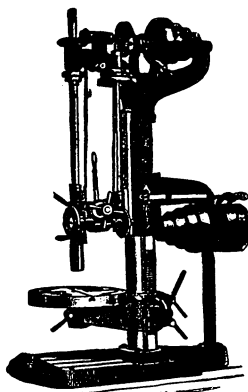
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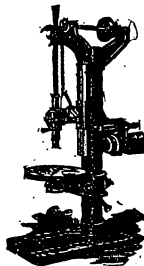
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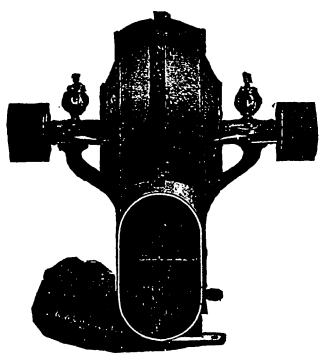
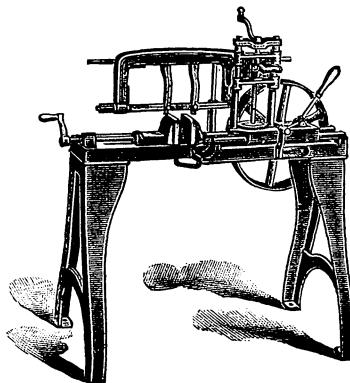


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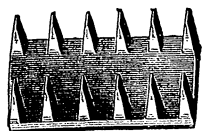
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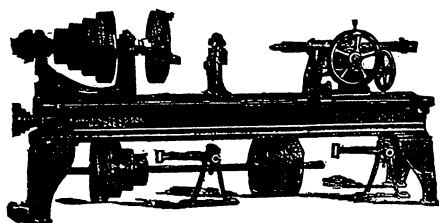
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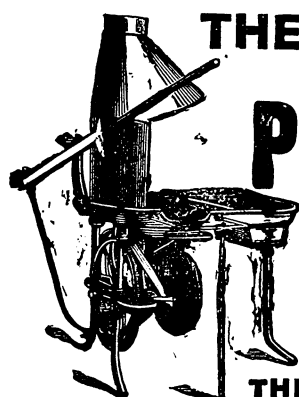
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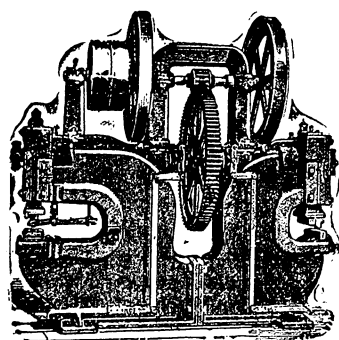
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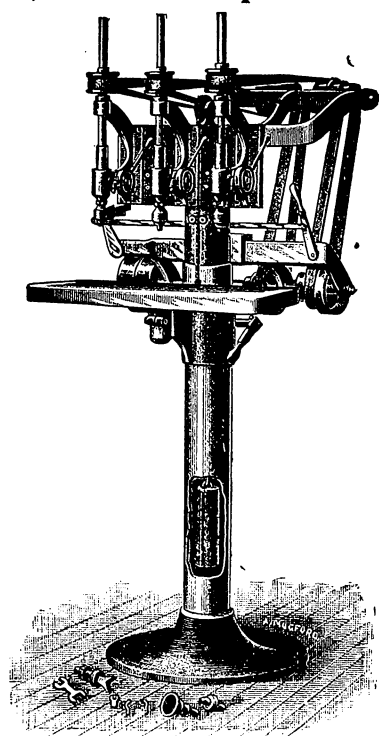
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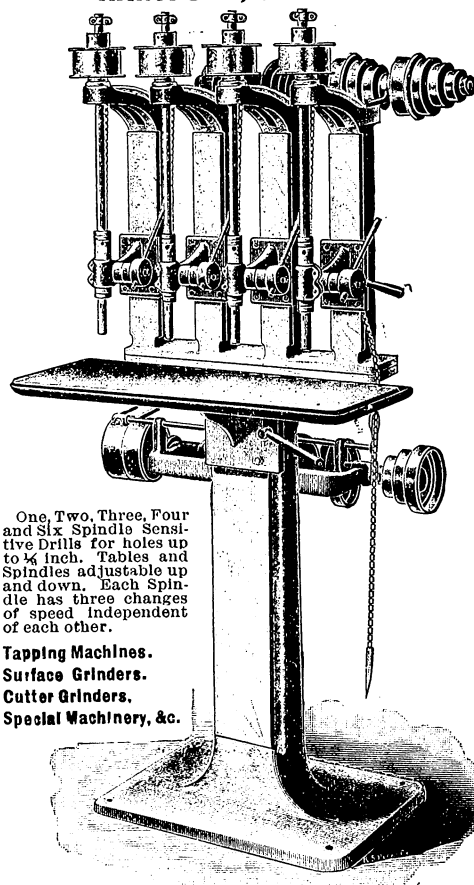
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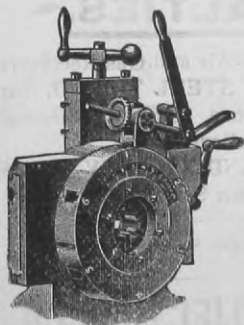
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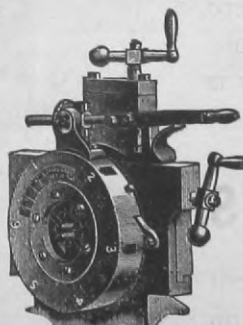
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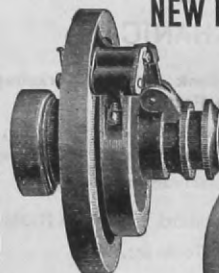
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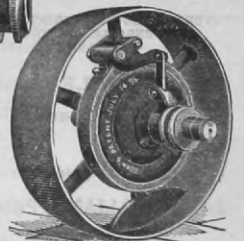
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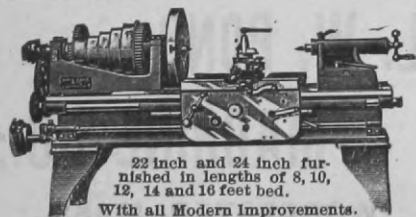
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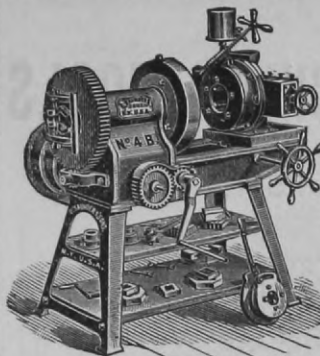
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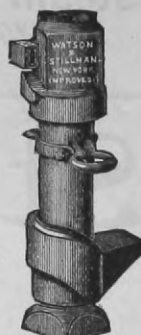


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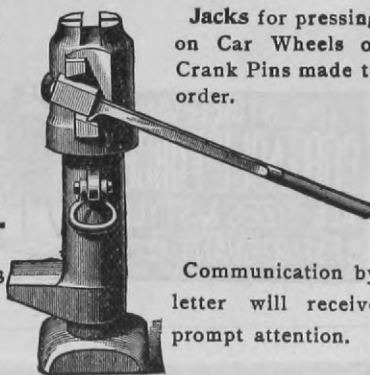
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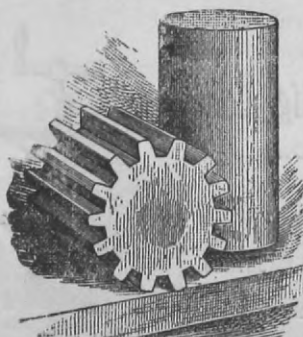
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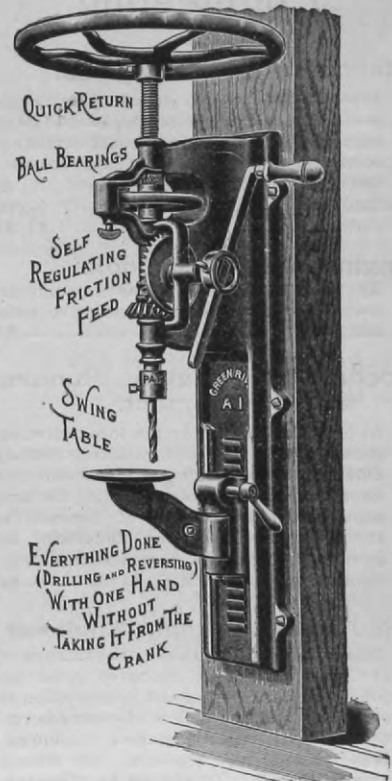
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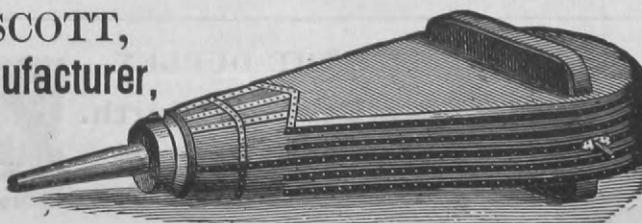
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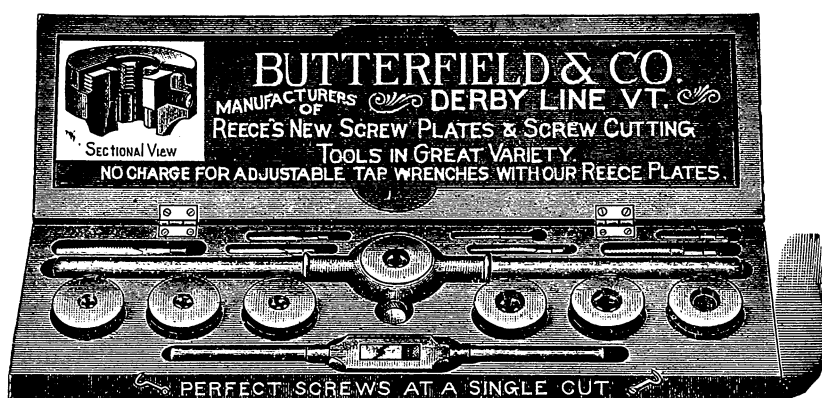
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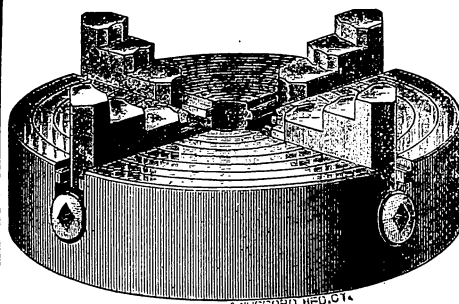
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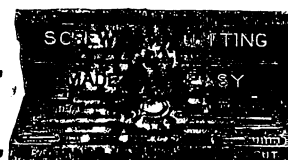


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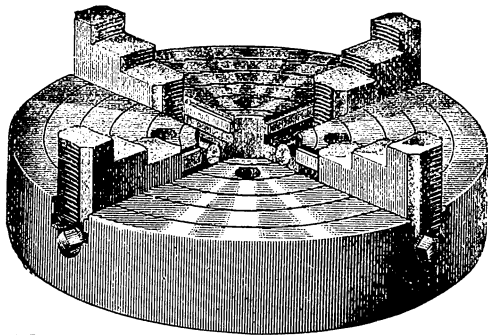
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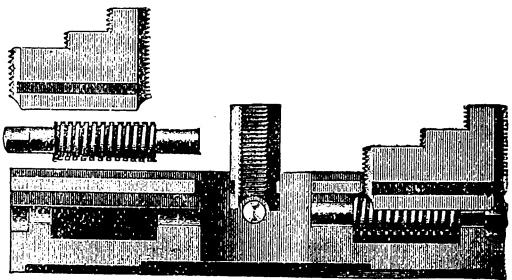
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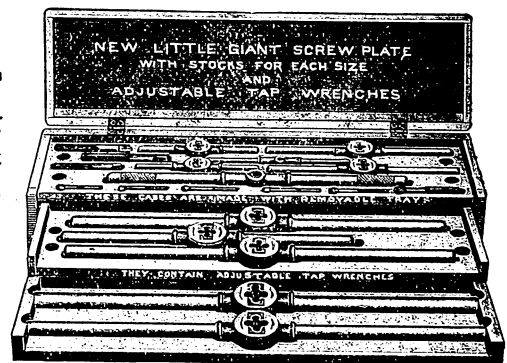
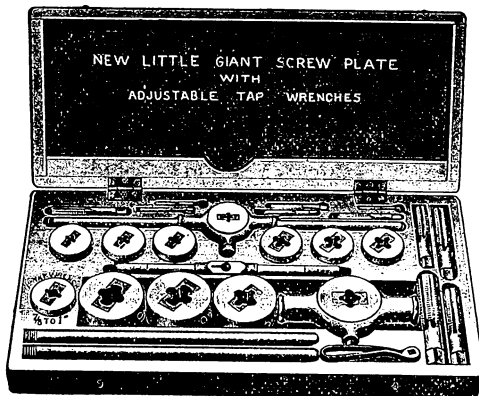
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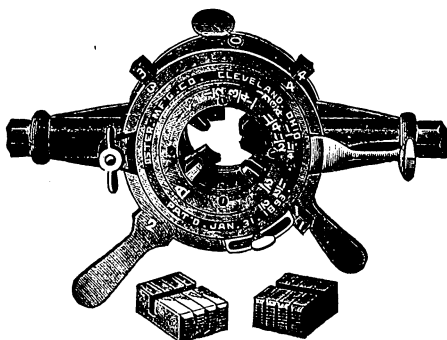
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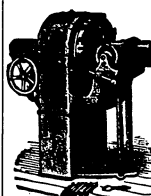
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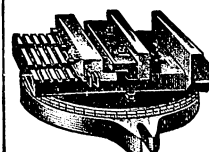
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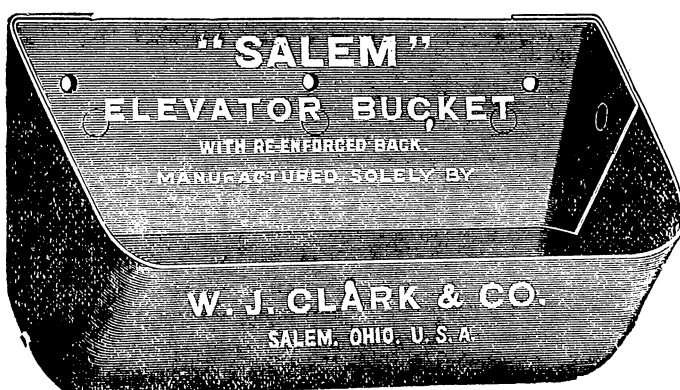
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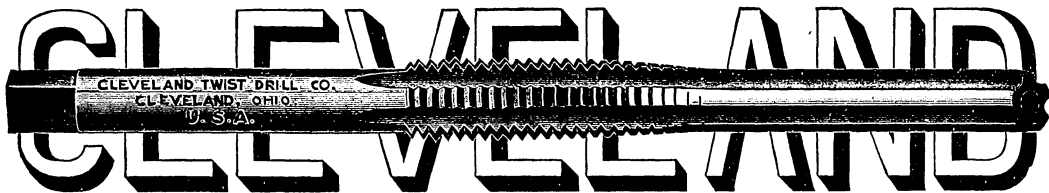
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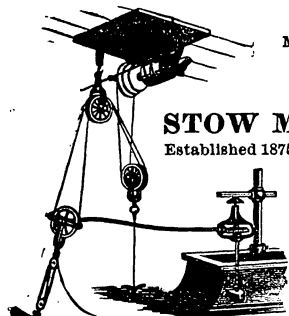
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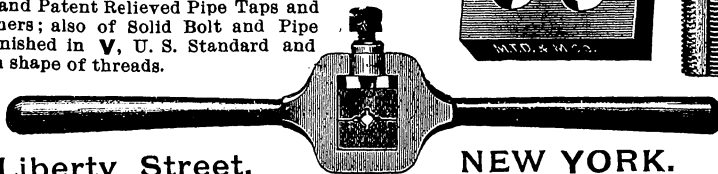
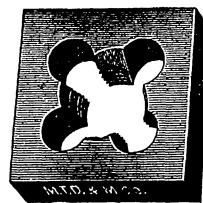
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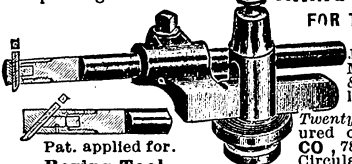
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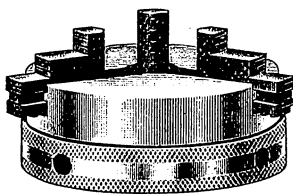
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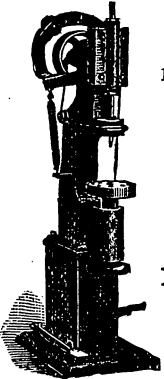


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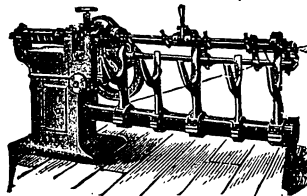
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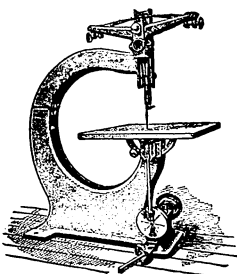
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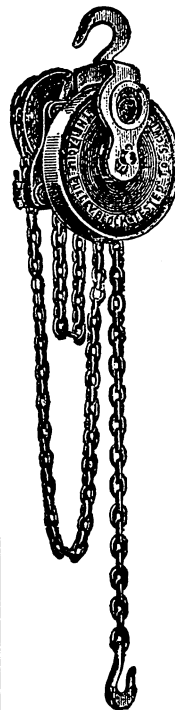
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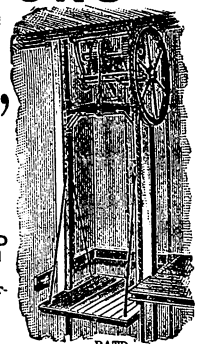
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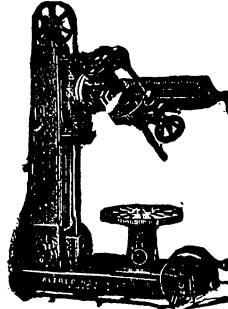
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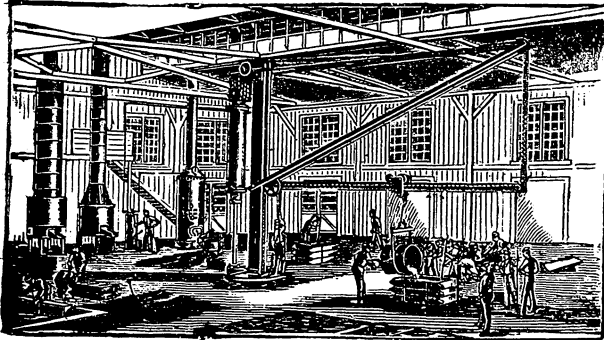
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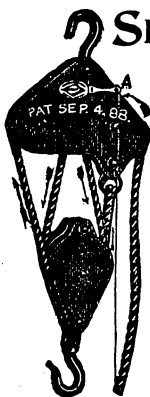
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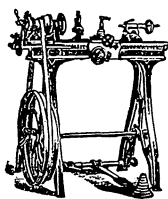
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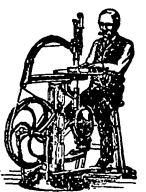
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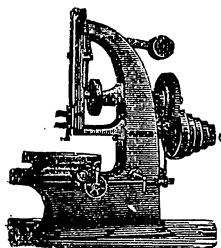
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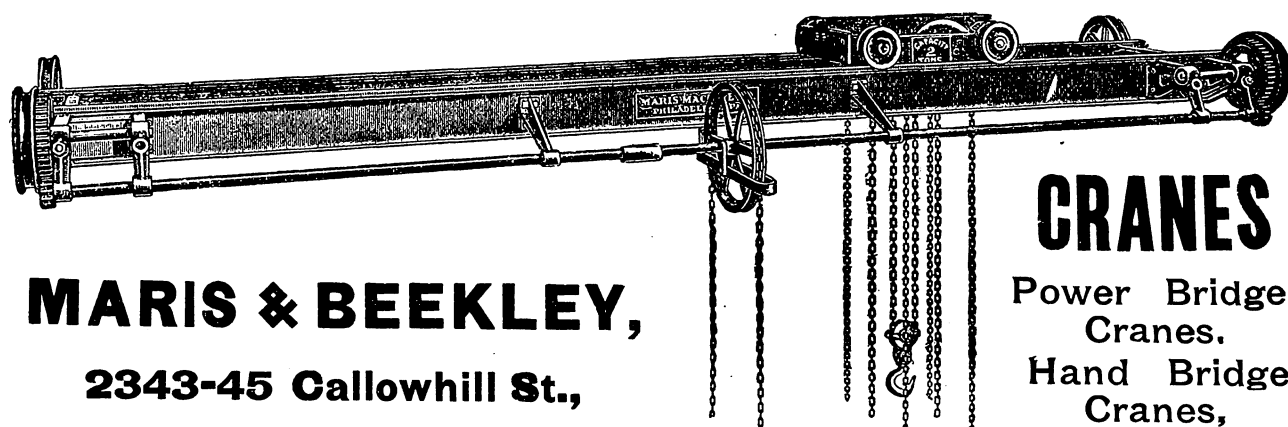
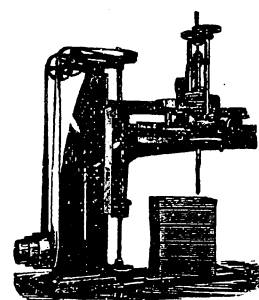


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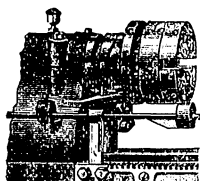
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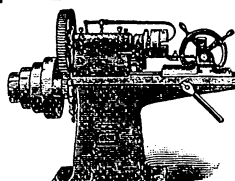
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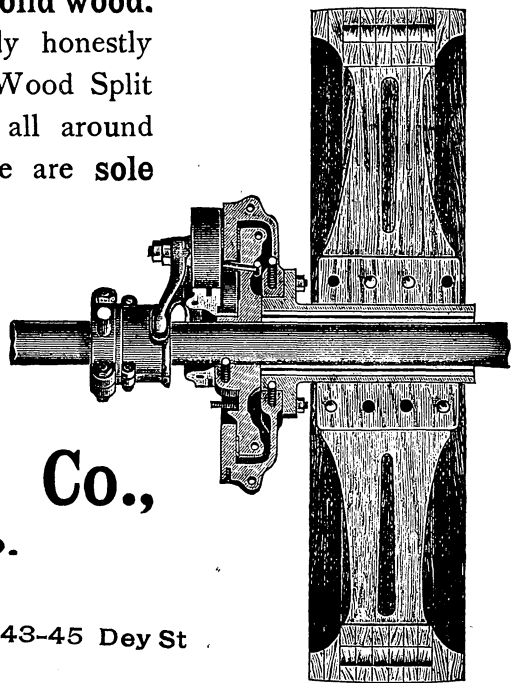
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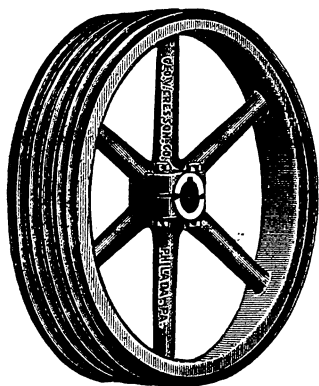
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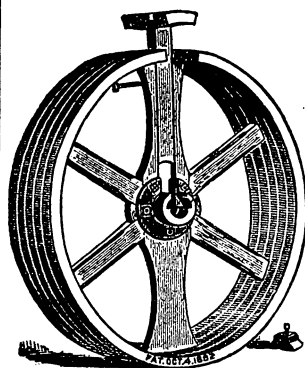
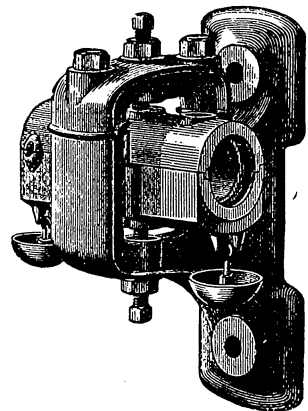
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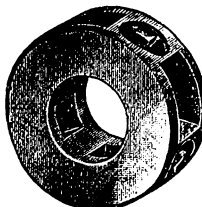
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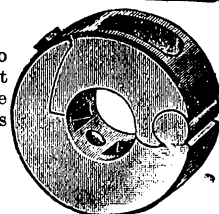
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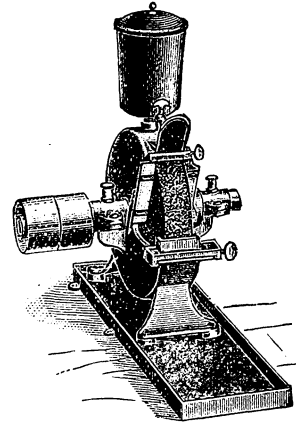
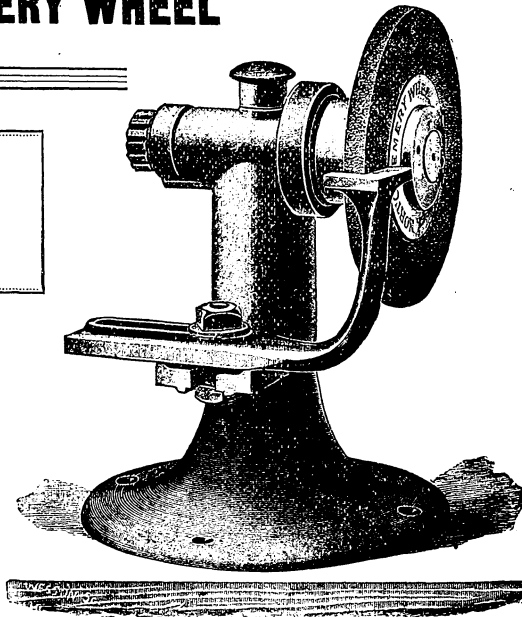
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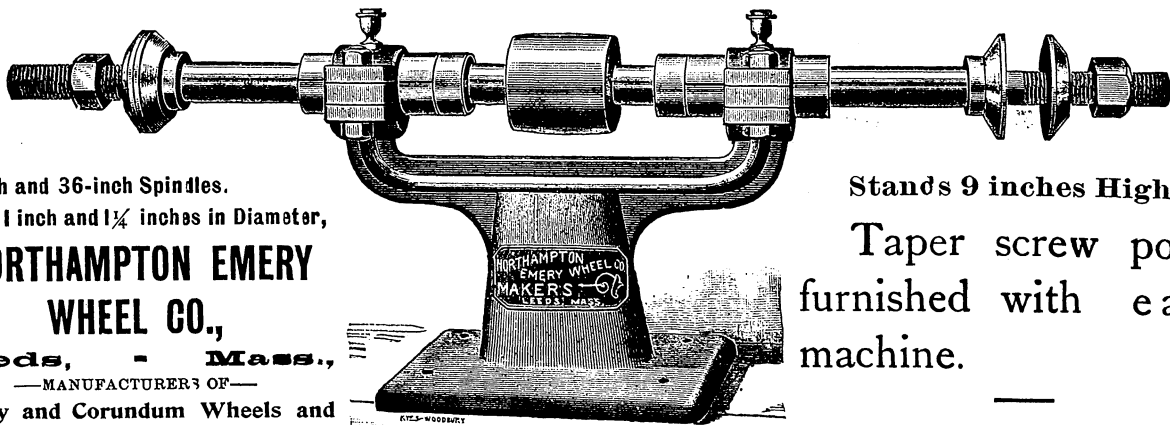
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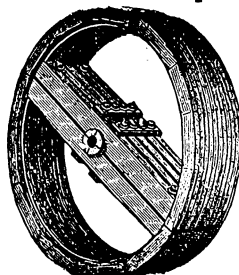
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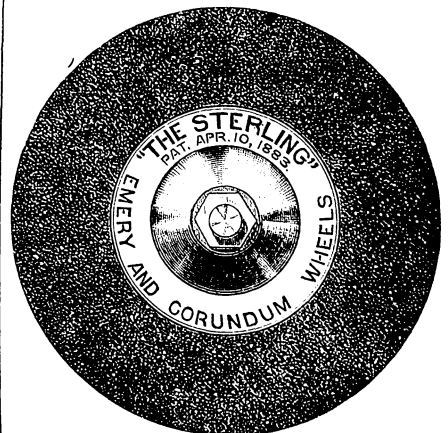
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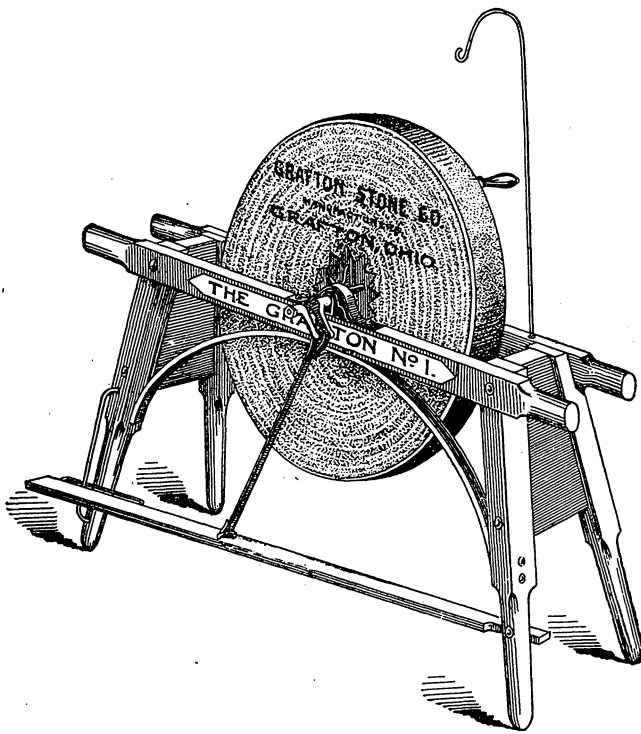
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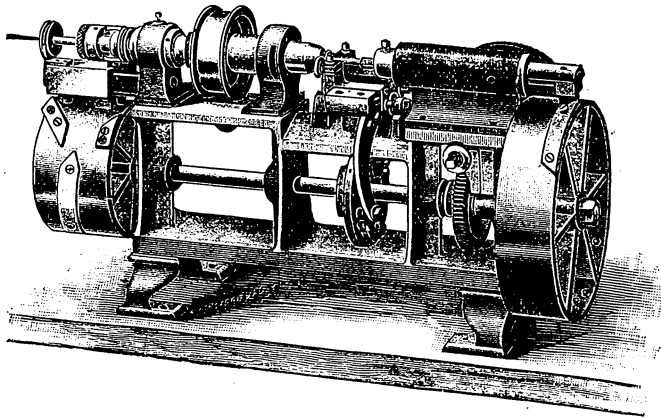


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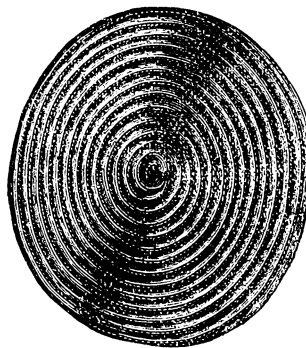
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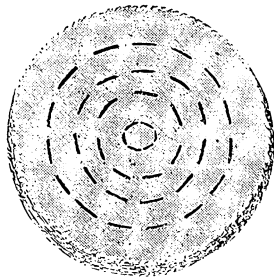
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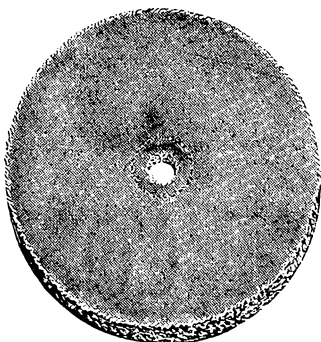
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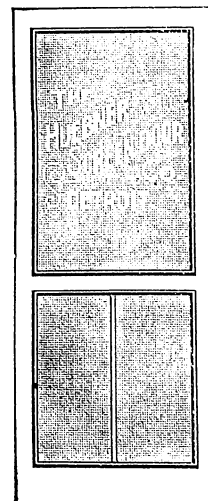
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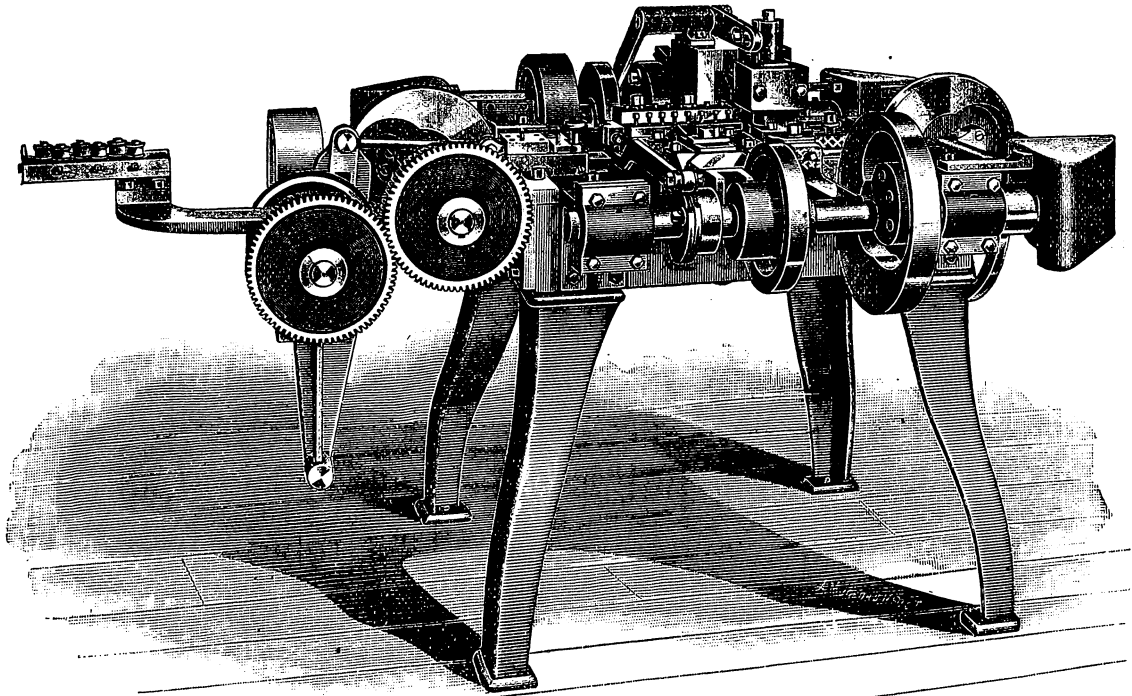
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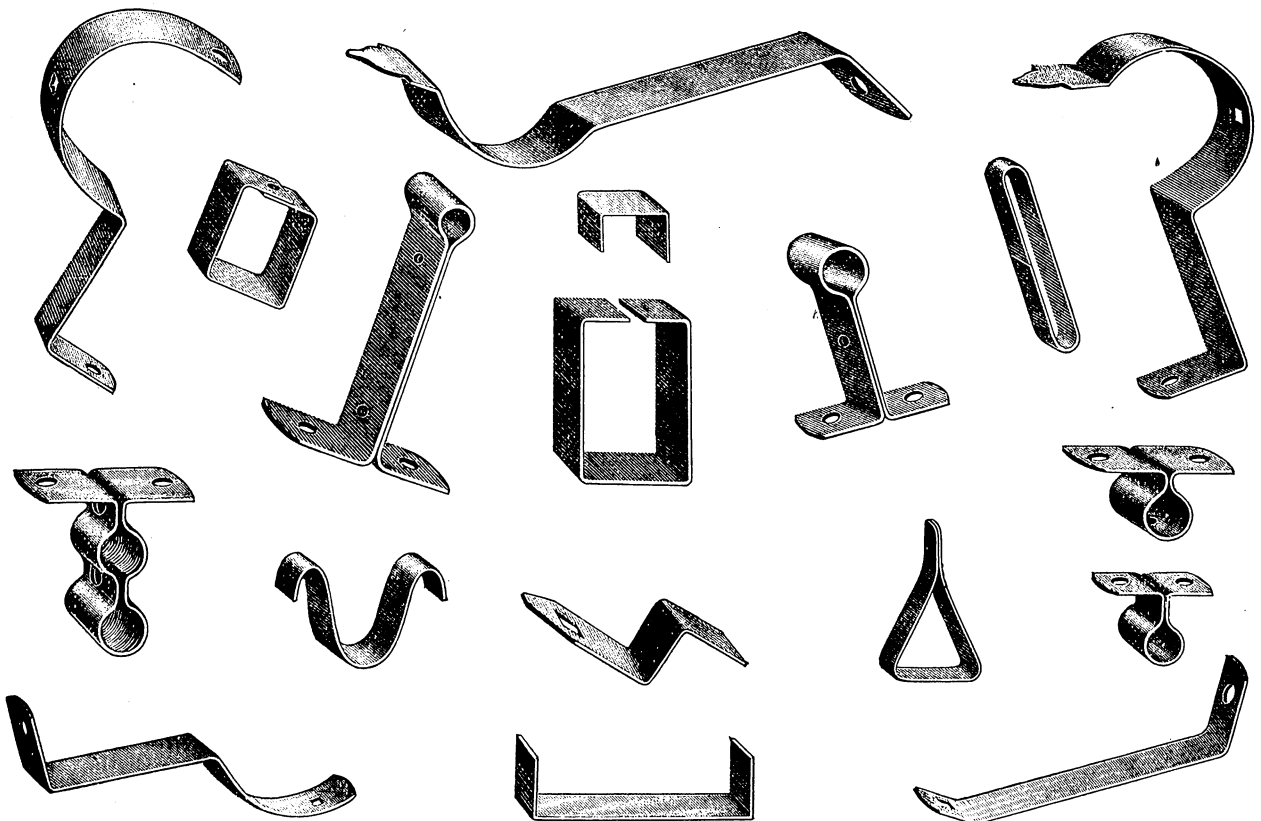
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**DOUBLE CORLISS CONDENSING ENGINE,** 600 H. P., One 15 inch by 42 inch Corliss Engine, 125 H. P., Double Automatic Engine, 350 H. P., two 100 H. P. Phoenix Automatic Compound Engines, 45 and 5 H. P., Westinghouse Engine, one 80 H. P. Beck Engine, one 7 x 7 Southwark Automatic Engine, one 4 H. P. Otto Gas Engine, 100, 200, 300 and 500 H. P. Feed Water Heaters, 30 to 100 H. P. Return Tubulars, 70 H. P. Locomotives, 60 H. P. Vertical Boilers, good for 100 pounds.

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## SOME BARGAINS HERE.

1 Hendey Shaper, 15 in. stroke, imp. visé.  
1 14 x 6 Screw Cutting Engine Lathe. New.  
Eastern Makers' Speed Lathe. 7 ft. bed, \$40. New.  
2 1/2 Hendey Cutting-off Machine. New.  
44 in. C. & D. Resaw. Fine condition.  
Radial Drill, 5 1/2 ft. arm.  
Axe Cutting-off Machine, Double Head, cut 9 1/2 dia.  
Quantity 2d hand Dodge Pulleys. Cheap.  
Safety Construction Company's combined Trap and Pump.  
And other machinery, new and second hand. Write for prices. **Machinists' Supply Company,** 39, 41 and 43 Central Ave., Rochester, N. Y.

## A LARGE ADDITION TO OUR STOCK OF CORLISS ENGINES.

Also HIGH SPEED, Etc.

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Corliss-26 x 48, 28 x 36, 30 x 72, 10 x 20. Several large sizes guaranteed, viz.: 18 x 48, 23 x 48, 28 x 48, 30 x 48, 26 x 60. Many other sizes on hand. Porter-Allen 11 x 16 and other High Speeds. An assortment of Horizontal Tubular Boilers, Large Duplex Fire Pump, Brennan Crusher, Platform Scales, Burr Mill, Bogardus Mill, etc., etc.

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20 Arc Light U. S. Electric Lighting Co. Dynamos.  
5 Hockhausen Dynamos.  
100 Arc Lamps.  
2 Double Hoisting Engines.  
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1 Bennett Air Compressor, 18-20 x 30.  
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230 New Steel Electric Car Wheels.

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Dealers in Scrap Iron, Metals, Machinery, etc.

## WE WANT TO BUY SCRAP,

Iron or Steel Rails,  
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Will pay spot cash for the above in carload lots.

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- 16 in. x 6 ft. Blaisdell.
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- 16 in. x 16 in. x 3 ft. Walter Bros.
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- 10 in. Juengst Crank.
- 10 in. Wood & Light Traverse Head.
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- 24 in. Hendey Friction.

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- 4 10 in. x 41 in. Garvin.
- 1 12 in. x 4 ft. Garvin.
- 1 12 in. x 5 ft. Back Geared.
- 1 20 in. x 6 ft. Back Geared.

### MISCELLANEOUS.

- Garvin Profiler, Or. Spindle.
- 6 in. Bement Slotter.
- 36 in. Gould & E. Automatic Gear Cutter.
- 26 in. Pulley Lathe.
- 5 in. Pulley Lathe.
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- No. 1 Garvin Screw Machine.
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- Several Wood Working machines.

Also a large number of other machines. Write for complete list and detailed description.

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**Raker Blowers,** Nos. 3, 4, 5, 6 1/2, and 7 1/2.  
**Root Blowers,** Nos. 1, 2, 3, 5, 6 and 7.  
**Worthington Duplex Pump, Compound,** 25 in. x 43 x 10 in. x 9 1/2 in. x 36 in. equal new.  
**D. W. Pond Planer,** 26 in. x 26 in. x 8 ft., equal new.  
**Niles Boring and Turning Mill,** 37 in., equal new.  
**9 Hewes & Phillips Lathes,** 12 in. to 21 in.  
Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.  
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## MACHINERY FOR SALE.

Planer 28 in. x 24 in. x 7 ft. New.  
Drill Press, 40 in. swing. New.  
Engine Lathe, 24 in. x 25 ft. bed. 2d hand.  
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Haskin Vertical Engine, 9 x 9. 2d hand.  
Improved 36 in. Band Saw. New.  
Vertical Boiler, 40 H. P. 2d hand.  
Open-end Bolt Cutter 1/4 to 1 1/4 in. 2d hand.  
Write us before buying. **COOKE & CO.,**  
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Two Double Deck Boilers, 40 H. P., Cheap  
Iron Tanks, Square, 4 x 4 x 6, 4 x 4 x 8, 4 x 5 x 11.  
Cylinder Boilers and Flues from 8 in. to 36 in. diameter, for stacks and water. Two Radiators.  
25 H. P. Engine and Boiler, Horizontal. 25 H. P. Locomotive Boiler. Iron Columns, several sizes. One Lathe. Blow-offs, all sizes.  
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**FLY WHEEL**  
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- 1 Corliss Engine, 24 x 43 Cylinder, built by Robert Wetherill & Co. of Chester, Pa., with main shaft and fly wheel.
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- 20 inch Muck Bar Train, rolls, housings, bolsters and couplings complete. Also rotary squeezer with cog gearing complete.

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## For Sale or To Let.

Well equipped small Machine Shop at Elizabethport, N. J. 25 H. P. Engine and Boiler complete, Lathe, Shaper, Drill Press, Forge, etc. All with shafting, belting, tools, etc., complete, ready to run. Will be sold cheap or rented to a good tenant. Apply to

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**SECOND-HAND MACHINERY.****ENGINE LATHES.**

10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & J.  
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 24 in., 26 in., 28 in., 32 in. and 36 in. Swing, 10 ft., 16 ft. and 18 ft. Bed Lathes, Fildell, Dustin, Blaisdell and Perkins.

**PLANERS.**

1 17 in. x 17 in. x 30 in. Hand Planer.  
 1 16 in. x 16 in. x 8 ft. Crank Planer.  
 1 17 in. x 17 in. x 3 ft. L. & M. Planer.  
 1 20 in. x 20 in. x 4 ft. L. & M. Planer.  
 1 24 in. x 24 in. x 6 ft. Pease Planer.  
 1 27 in. x 27 in. x 5 ft. White Planer.  
 1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads.  
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**DRILL PRESSES.**

2 20 in. Drill Presses, Prentice & Davis.  
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 3 Slate Drills, 1 one-spindle, 2 two-spindle.  
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 1 each No. 2, 3 and 4 Garvin Gang Drills.

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15 in. Stroke, Smith.  
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**SPEED LATHES.**

10 in., 12 in. and 14 in. Swing, 3, 4 and 5 ft. Beds, Garvin and Spencer.

ALSO LARGE STOCK NEW TOOLS.

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**RAILS FOR SALE. Second-hand Relaying.**

1000 tons 60 lb. Steel.	50 tons 35 lb. Iron.
150 " 60 lb. "	150 " 30 lb. "
1000 " 56 lb. "	300 " 25 lb. Steel.
150 " 52 lb. Iron	60 " 20 lb. "
and Steel.	20 " 36 lb., 4 in.
40 tons 40 lb. Iron.	Johnson Girder
250 " 40 lb. Steel	Rails.

27 different gauge second-hand locomotives.  
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Ready for instant delivery, 1000 tons new standard 9 in high 80 lb. side bearing Girder Rails with fittings complete.

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By a thoroughly equipped general foundry and machine works, some specialty to manufacture in large quantities in machinery or heavy hardware line. Would also undertake to market the product if desired Address

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Well equipped general machine shop and foundry; lathes, planer, shaper, etc.; fine stock of patterns. Good supply of tools. All in good condition. Fine location. Railroads in 11 directions through the most prosperous section of the South. Only one manufacturing competitor. Fine chance for a young man or for a branch business. Will sell on easy terms. Wish to retire on account of age

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**20 in. x 8 ft. Pattern Lathe.****MILLING MACHINES.**

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 1 No. 18 Garvin New Pattern Miller.  
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1 Plain 12 in. Monitor, 4 in. Chuck and cut-off Hand Turret.  
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**MISCELLANEOUS.**

1 Wilder No. 3 Power Punch.  
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 1 No. 3 Hand Shear for 1/4 in. Iron.  
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 3 Buffing Spindles.  
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 1 Machinists' Forge.  
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 2 No. 4 Emery Grinders.  
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Complete plant of machinery of the Hickory Wheel Co., at So. Framingham, Mass., for making bicycles. Run about a year only and as good as new, consisting of

**Flather and Pratt & Whitney Engine Lathes and Screw Machines,**

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**Hendey and Whitcomb Planers, Elliott and Prentice Drills,**

polishing and grinding machines, special wood working machines for making wood rims.

Send for special circular B 31.

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Two Guild & Garrison Steam Pumps, 18 in. steam cylinders, 12 in. water cylinders, 24 in. stroke, strictly first-class. Capacity 600 gallons each per minute at ordinary speed.

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One No. 5 Root Blower, in use about two years. In perfect condition. Also one Cupola Shell, 72 inches in diameter, 45 feet high, 11 1/2 feet to bottom of charging door.

**MENARD MANUFACTURING CO.,**  
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## Heavy Pressure PUMPS FOR SALE CHEAP.

Two pairs of

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14 in. x 24 1/2 in. x 3 1/2 in. x 18 in. stroke. Adapted to 2000 lbs. pressure per square in. In good order. Complete, with condensers.

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About 4000 tons second-hand 58 lb. Steel T Rails. Fit to relay. Fastenings to match. Will divide the lot if necessary. Also several Locomotives and Passenger Coaches in good repair. Address

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One Dienelt & Eisenhardt DEAD STROKE POWER HAMMER, with 75 lb. ram. In first-class order. Built about a year and a half ago. Run only a few months. Now in Philadelphia. Will be sold cheap if taken before removal.

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**Steam Hammer.****FOR SALE CHEAP.**

An 1100 pound Steam Drop Hammer will be sold cheap. Is in good condition.

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**WANTED.**

To buy for cash, first-class second-hand Engine Lathes, Planers, Drill Presses, Shapers, Milling Machines, Etc., Address

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Offers for sale at very low prices **BESSEMER STEEL WORKS; STRUCTURAL STEEL MILLS, also STEEL MILL FOR ROLLING BARS AND COLD ROLLING, 2 BLAST FURNACES, RUSTLESS IRON WORKS, GLASS WORKS, FOUNDRY, PLANING MILL, BRICK WORKS, and numerous other manufacturing interests and large quantity of very desirable Coal Properties improved and unimproved.**

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By a thoroughly equipped general foundry and machine works, some specialty to manufacture in the machinery line. Heavy machinery preferred. Address

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Foundry and Machine Shop at Bellevue (Schenectady), N. Y., consisting of main building 112 ft. x 90 ft., with Gallery, Store house 120 ft. x 20 ft., Blacksmith Shop 40 ft. x 18 ft., Pump House, containing 15 in. Duplex Pump piped ready for operation, with fire hydrants throughout building. Annex to main building 200 ft. x 43 ft. Main building contains Yale & Towne 10-ton electric crane 49 ft. span, which runs entire length of building, also two 10-ton Foundry Cranes. Cupola 42 in. inside lining, with No. 8 Sturtevant Pressure Blower; Cupola is piped and lined ready for operation. 75 H. P. Boiler, Engine, Line Shafting, Oven for drying molds 16 ft. x 12 ft. x 10 ft. with track and car, and in fact everything necessary for a complete foundry plant ready for immediate operation. This property contains ten acres of land and is underlaid throughout with molding sand of best quality. A stream of pure soft water of 2,000,000 gallons capacity per day crosses the lot. Double track railroad siding on lot. Fairbank's R. R. Scale and Wagon Scale. This plant is entirely new and has never been started. Must be seen to be appreciated. Will be sold for one-half the cost of building alone. Address, for further information,

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 TO SELL  
 ELECTRIC MOTORS,  
 DYNAMOS AND APPLIANCES.  
 CHAS. GORTON, Racine, Wis.**

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The Receivers offer for sale the entire Plant of this well known Corporation, located for 50 years at South Newmarket, N. H., manufacturing Engines, Boilers, Steam and Hot Water Heating Apparatus, Gas Retorts, Shoe Machinery, Steam, Water and Gas Pipe and Fittings, and doing a General Iron and Brass Foundry and Finishing Business. Its location is one of the best in New England, being on the Squamscot River, a branch of the Piscataqua, 14 miles from Portsmouth, Rivers being navigable for vessels drawing 11 feet and Co. having Fine Stone wharves fitted to discharge, hoist and house Entire Cargoes of Iron, Coal or Sand or ship Heavy Machinery to Foreign or Domestic Ports without re-handling.

Manufacturing Plant, proper, covers about 10½ Acres, on which are the Offices, Stock and Pattern Store Houses, Wood Working and Pattern Shops, Iron and Brass Foundries, and Finishing Shops, Machine, Boiler, Fitting Shops and Pipe Mills, and Furnaces all fitted with suitable improved and valuable Machinery and Tools including Patent Improved Pneumatic Caulking Tools for Boiler-Making, Plate Rolls, Shears, Large Planers, Radial Drills, Bit and other Lathes, &c.

Boston & Maine R. R. runs through the Premises, with sidings permitting rolling of Heavy Machinery from Shop Floors on to Cars. Plant is but 50 feet from Passenger Station and is admirably adapted for manufacture of Stove Castings, Tools and Machinery for New England trade, Electric or other specialties, and Jobbing and Repair work for the numerous Mills and Railroads in New England. In the neighborhood of the Plant are also various Lots of Land, some improved with dwellings, large and small, in good repair, suitable for private residences and boarding-houses for employees, and some Wood lots: all of which we offer for sale.

Entire property, Real and Personal, including Patterns, Drawings, Stock of Steam and Hot Water Heaters, Radiators, Stationary and Portable Engines, Upright and Horizontal Boilers, Wrought, Cast Iron and Composition Pipe Fittings, Valves, &c., manufactured and in process, Scrap Iron, &c., Horses, Wagons, Safes and Office Furniture, will be sold as a whole, or in lots to suit purchasers, as may seem best for the interests of all concerned, and offers for all or any portion of it may be submitted to the under signed.

Further information and permits to inspect the property may be obtained by applying in person or by mail to

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WOODWARD EMERY,

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New Nos. 17 and 19.

## FOR SALE OR EXCHANGE AT LOW PRICES.

One Morgan Steam Hammer, 4000 lbs. stroke.  
Three Tubular Boilers, 18 feet long, 6 feet in diameter, having fifty-eight 4 in. tubes, with stacks and breeching, also fronts and settings, all in first-class condition.  
One Sturtevant Blower, or Fan, No. 39, very large, and in good condition.  
One Mine Pump, Duquesne make, with bronze water cylinder.  
One Knowles Boiler Feed Pump, No. 7.  
One Horizontal Reversing Engine, cylinder 14 in. x 24 in.

Low prices will be made for all or any of the above. We will make an exchange deal for any of the following material.  
One Squaring Shear, for cutting iron and steel sheets.  
One Stand of Cold Rolls and Housings for the same.  
One 50 or 35 ton Fly Wheel.  
One Wrought iron Fly Wheel Shoe.

The above material must be in good condition. For particulars address

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## FOR SALE.

1 42 x 60 Vertical Corliss Engine.  
1 150 H. P. Armington & Sims Engine.  
1 100 H. P. Fire Box Boiler. "New."  
1 100 H. P. Westinghouse Engine. "Good order."  
1 Columbus Blowing Engine 16 x 24. 32 x 24.  
Also a large number of other engines, boilers and machine tools. Write for prices.

WM. C. JOHNSON & SON MACHINERY CO.,  
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## FOR SALE.

A valuable patent which is being manufactured on royalty by a large manufacturing concern and patented in 1893, since which time it has been adopted as the standard in its line by the leading hardware jobbers throughout the United States. Satisfactory reasons given for selling. Address

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Plumbers' Iron Pipe and Fitting Patterns, includes arbors, benches, flasks, &c., for sale low. Address  
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### ONE METAL PLANING MACHINE

30 in. x 30 in. x 8 ft.

First class condition.

THE POWELL PLANER CO.,  
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An established wholesale and retail business in Crockery, Glassware, Tinware and Stoves, located in a live city of 50,000 inhabitants. Has been in successful operation for 15 years and is the only crockery and glassware jobbing house in the city and in a radius of 150 miles. The owners have other interests that require their attention is their reason for selling. This is an opportunity that is seldom offered and will pay you to investigate. Business has been well advertised and has a good list of regular customers. This is no forced sale and the good will of the firm is valuable. Stock has been reduced to \$18,000 or \$20,000. Address

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One of the oldest established retail and wholesale Hardware, Stove and Plumbing businesses in Luzerne County. Situated at Wilkes-Barre in the heart of the richest coal field in America. Will sell stock reasonable and charge nothing for good will. Will either sell or give liberal lease on building, which is 25 by 104 ft., six stories high, on one of the most prominent business corners in the city. Our reason for selling is, our manufacturing business in another part of the city has grown to such proportions that we desire to devote our entire attention to same

W. B. BERTELS, SON & CO.,  
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**FOR SALE.**—To close an estate, on account of death of principal. An old and well established jobbing and retail Hardware business, located in one of the largest manufacturing cities in the State of California. The best location in the State outside of San Francisco for a jobbing business. Stock is well assorted and consists of shelf and builders' hardware, mechanics' tools, bar and sheet iron, etc. Will inventory about \$40,000. Terms and statements to principals only. Address "A. B. C.," Box 104, office of *The Iron Age*, 96-102 Reade St., N. Y.

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A good opening for any one wanting to go into business. Wanting to get out of business I offer my entire stock of Hardware and Agricultural Implements for sale. This is a good opening for a live man. The business is well established and is a money maker. A better opening cannot be found anywhere. The right kind of a man can work up a large trade. The stock can be reduced to suit the purchaser. Good reasons for selling. Address A. D. HOGENDOBLE, Osborn, Ohio.

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LOFTS TO LET.

Second, third and fourth floors. Steam heat and elevator. Building has been thoroughly overhauled. Immediate possession. JOHN F. DOYLE & SONS, 45 William Street.

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The oldest and best located Hardware Store in a manufacturing town of 6000 inhabitants. Stock consists of Builders' and Shelf Hardware, House Furnishing Goods, Glass, Paints, Oils, etc. Will inventory from \$11,000 to \$14,000. Competing lines of railroad and express. Situated in Eastern Central Pennsylvania. Address "SELLER," care *The Iron Age*, P. O. Box 521, New York City.

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Successors to  
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Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

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At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft. Cement floor. One 2-story building, 35 ft. x 45 ft. ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barb wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufacture of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill, steam and water power, situated on same side of Canal. For further particulars address

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A comfortable and convenient office, nicely carpeted, steam heat and gas, including desk and office furniture, on second floor, No. 2½ Murray St. Also floor space if desired. Cheap to the right party.

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A modern equipped construction plant, consisting of Foundry, Machine and Pattern Shops, with trade established for ten years. Large and valuable lot of patterns and drawings. Doing a business of \$150,000 per annum. Well located for railroad facilities. Amount of capital invested \$50,000. One half cash and balance long time. An opportunity seldom met with. Business has always been profitable. The plant must be sold to settle an estate. None need apply but those meaning business, to whom full information will be given. Address "PLANT," care *The Iron Age*, P. O. Box 521, New York City.

## FOR SALE.

A valuable United States patent. Can be manufactured at a small cost and sold for a good price to dealers in machinists' tools, hardware manufacturers, clock manufacturers, &c. Nothing of the kind on the market. Will be sold cheap and full particulars given.

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MANUFACTURED BY  
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RAVENNA, OHIO.  
WRITE FOR CATALOGUE.

## WANTED.

A lot of 1 in. and 1½ in. Wrought Iron Steam Pipe, new or second-hand, to be used for railing purposes. Factory seconds would answer. Address 105 Market St., Camden, N. J.

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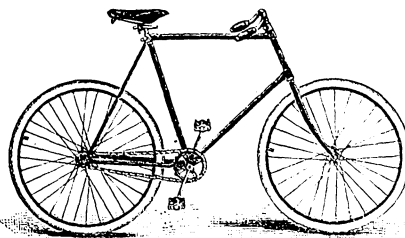
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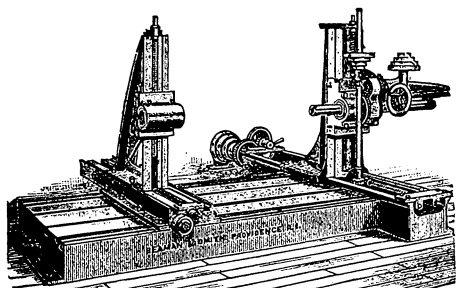
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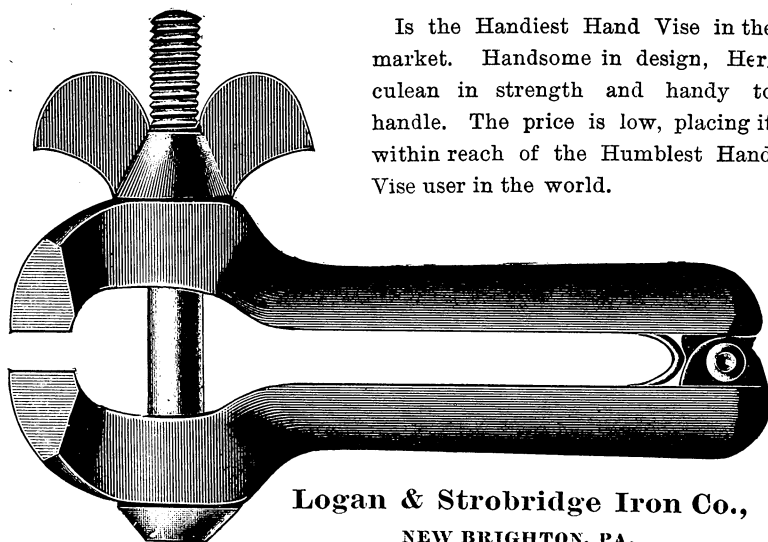
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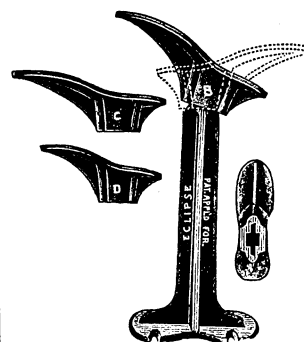
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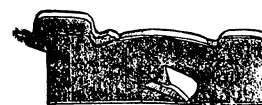
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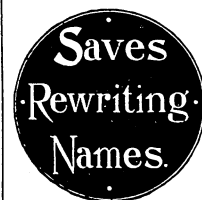
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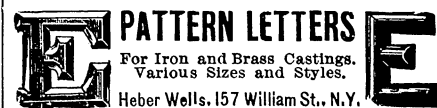


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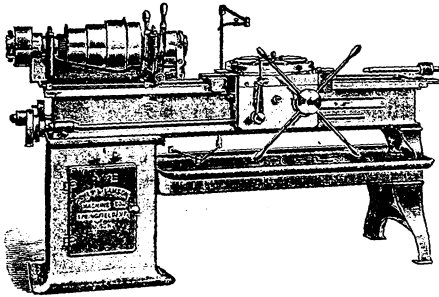
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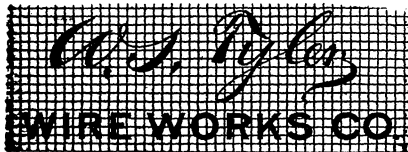
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FOUNDRY RIDDLES, COKE AND  
COAL SCREENS.

W. S. TYLER, Pres. PROCTOR PATTERSON, Sec. & Treas  
CLEVELAND, OHIO.

LABORATORIES OF

DR. GIDEON E. MOORE,  
221 Pearl St., New York.

DEPARTMENT OF CHEMISTRY. Analyses and  
Assays of Ores, Metals, Waters, Fuel, Oils and  
Natural and Industrial Products of every  
description.

DEPARTMENT OF PHYSICAL TESTS. Chas. F.  
McKenna, Director. Tensile, Transverse and  
Compression Tests of Iron, Steel and other  
Metals and Alloys, Cements, Building Stones  
and Engineering Materials generally. Tests of  
Lubricating Value of Oils, etc., etc.

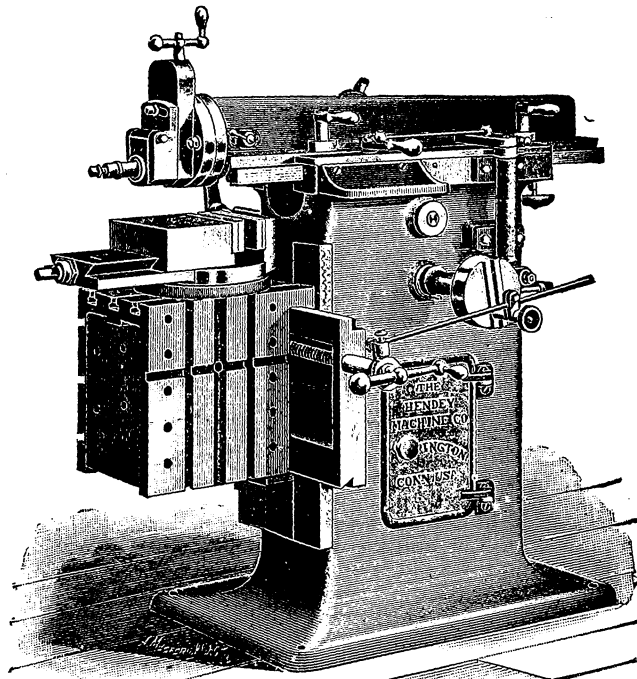
PRINTED PRICE-LISTS ON APPLICATION.

### The Pittsburgh Reduction Co.

Pittsburgh Office, 701 Ferguson Block,  
119 Third Ave., Pittsburgh, Pa.  
New York Store, 4 Havemeyer Build-  
ing, Cor. Church and Dey Sts., N. Y.

## ALUMINUM

Ingots, Plates, Bars, Sheets,  
Wire, Tubes and  
Castings.



24-inch Improved Hendey Shaper.

**COMBINES** the LATEST and BEST Improvements.

Useful Attachments, Strong and Powerful. Changes  
Made Rapidly. Uniform Cutting Speed. For Tool  
Room use or all around Machine Shop Work.

## THE HENDEY-NORTON LATHE.

It stands at the head. It has no rival.

It represents modern ideas and modern practice in  
Screw Cutting Engine Lathes.

We challenge a comparison of its conveniences,

Useful attachments and every day merits with ANY lathe made.

Buy the best. Keep up with the times.

Send for Circulars.

**The Hendey Machine Co., Torrington, Conn.**

EUROPEAN AGENTS:

SCHUCHARDT & SCHUTTE, Berlin.

CHAS. CHURCHILL & Co., London.

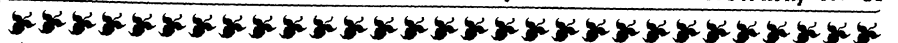
EUGEN SOLLER, Basel, Switzerland.

## FOR BICYCLE MANUFACTURERS

**Spring Vise Jaws for holding thin tubing.**

For particulars apply to

**THE NEWARK MACHINE TOOL WORKS, - - Newark, N. J.**



**S**PRING will come again. Now is the  
time to order the . . . .

**Stearns = Lawn = Mower**

**D**ON'T let the grass grow under  
your feet. . . . .

**E. C. Stearns & Co., Syracuse, N. Y.**



**Beating** "365 DAYS AHEAD OF THEM ALL."  
 17 to 23 CATALOGUE FREE  
 FACTORY. HOLYOKE, MASS.

Lines <sup>A</sup><sub>D</sub> Prices <sup>A</sup><sub>B</sub> Right.

We shall have an agent in every town Speak early.

# MAJESTIC BICYCLES.

Light Roadster

Weight, 23 lbs. List, \$75.00.

HULBERT BROS. & CO.,

26 WEST 23d STREET,  
NEW YORK.

Chicago Office, 616 Chamber of Commerce.

WRITE FOR PRICES.

THE WILLIAMS PRINTING CO.,  
Commercial Printers and Binders

CATALOGUES A SPECIALTY.

96-102 READE STREET, NEW YORK

## WHITE MOUNTAIN FREEZERS.

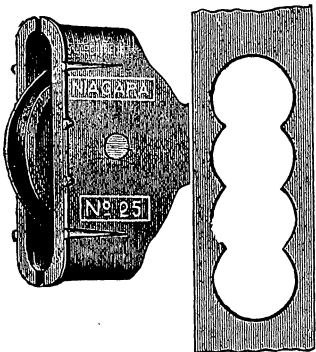
THE  
BEST  
FREEZER.

Heavy Waterproof Tubs. Cans of Charcoal Tin-plate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered.

Inquire of any leading jobber or write us.

THE  
BEST  
SELLER.

The White Mountain Freezer Co., Nashua, N. H.

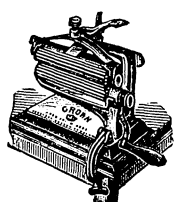


### THE REPUTATION

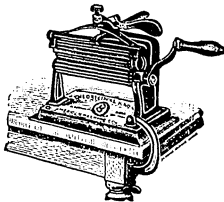
of the 'Niagara' and original "Clark" patterns of FRAME PULLEYS makes them desirable goods for any hardware dealer to handle. We have purchased the patterns and all interests of The Shepard Hardware Co. in these goods, and they will in future be made solely by us. We make the prices right, too.

The Wrightsville Hardware Co., Wrightsville, Pa.

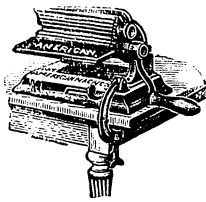
Surpless, Dunn & Alder, 15 Murray Street, New York Agents. Henry Keidel & Co., Southern Agents, 25 Hanover Street, Baltimore, Md. Chas. L. Pierce & Co., 202 Market Street, San Francisco, Cal.



Crown.



Original Knox.



American.

### FLUTING MACHINES.

FOR CATALOGUE, PRICE AND DISCOUNTS WRITE TO

North Bros. Mfg. Co., - Philadelphia, Pa.

or JOHN H. GRAHAM & CO., Manufacturers' Agents, 113 Chambers St., New York.

## COVERT'S VICTOR WAGON JACK



Has no equal. The lever power is enormous. Only one size required, as it adjusts itself to and will lift with ease the lightest carriage or heavy truck. Weighs only 7½ lbs. Has straight lift and will not tilt. Being made of iron it is indestructible.

The Price is the Lowest.

We are headquarters and No. 300. the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

Covert's Saddlery Works,  
FARMER, N. Y., U. S. A.

# 1895

## Columbia Bicycles

### \$100.

Hartford Bicycles, \$80.

Wizards, \$60, \$50.

The above will unquestionably be the easiest line of bicycles to sell in 1895, and the dealer who has the exclusive Columbia agency for his vicinity will be fortunate. We invite correspondence with enterprising firms of good standing who have facilities for doing a first-class bicycle business.

POPE MFG. CO.,

221 Columbus Ave., Boston, Mass.

## MECHANICS



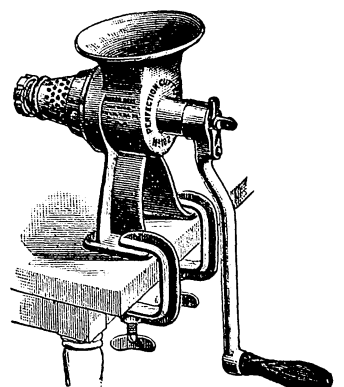
DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to The Correspondence School of Mechanics, Scranton, Pa.

The NEW 1894 PATTERN

### PERFECTION CUTTER.

Improved and Enlarged.

Simple to use.  
Easily cleaned.  
Of few pieces.  
No parts to wear out.



# REID DRILL CHUCKS.

## THREE SIZES.

No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " " 0 " 3-4 " "

No. 2 " " " " 0 " 1 " "



They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

SEND FOR CIRCULAR.

R. H. BROWN & CO., - New Haven, Conn.

*You take no risk on the quality.  
We make only the best!*



**Sand  
Papers**

in  
Reams and Rolls

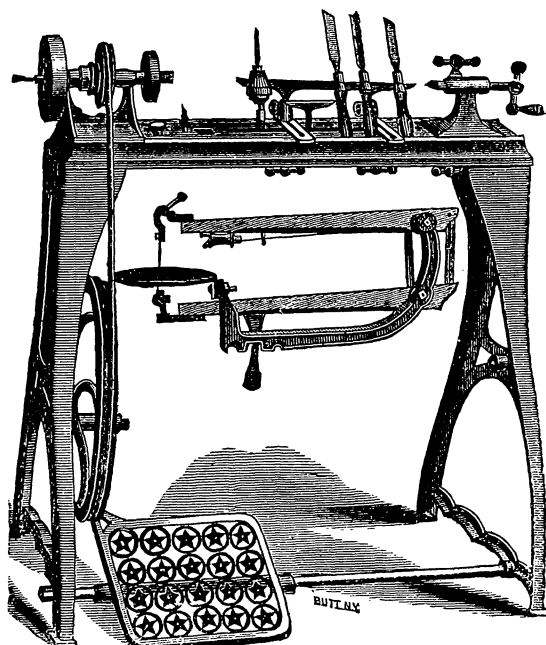
(Flint Paper  
Garnet Paper  
Emery Paper  
Emery Cloth)

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

**BAEDER, ADAMSON & Co.**

730 MARKET STREET, PHILADELPHIA.  
67 BECKMAN STREET, NEW YORK.  
143 MILK STREET, BOSTON.  
182 LAKE STREET, CHICAGO.

# HOLIDAY GOODS.



Many kinds of Scroll Saws have been put on the market by ourselves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

Those who want a good Lathe with Scroll-Sawing Attachment and all Tools and Improvements to the very latest moment will buy the Goodell Lathe.

Those who want only a Scroll Saw with Drilling Attachment and Rubber Blower will prefer the Rogers Saw.

These two machines are taking the place of all others, and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

Price of Goodell Lathe, complete, \$12.00.

Price of Rogers Saw, complete, \$3.50.

# MILLERS FALLS CO.,

93 READE ST., NEW YORK.

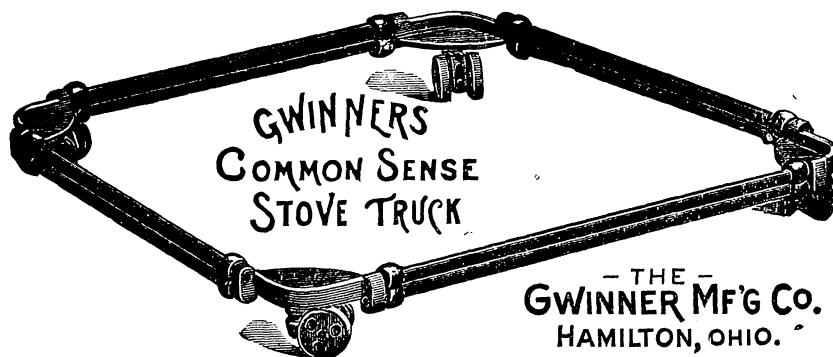
## THE GEM SOLID STEEL MINCER



Single  
and  
Double Blades.

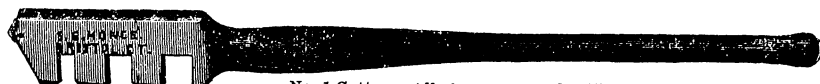
Handle and Blade Formed in one piece.  
Always Clean. Indestructible.  
No Rivets to Wear Loose.  
No Wooden Handle to Shrink, Swell, loosen, Split, or Fill with Rancid Grease.

MANUFACTURED BY  
**PALMER HARDWARE MFG. CO.**  
TROY, N. Y.



- THE -  
**GWINNER MFG CO.**  
HAMILTON, OHIO.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS.

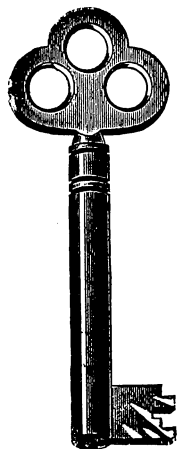


No. 1 Cutter. All glass men are familiar with this tool.  
**S. G. MONCE, BRISTOL, CONN.**



# CABINET LOCKS

OF EVERY KIND.



DRAWER LOCKS,  
CUPBOARD LOCKS,  
WARDROBE LOCKS,  
CHEST LOCKS,  
DESK LOCKS.

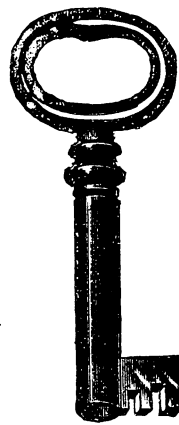
A complete line of more than 1000 list numbers exclusive of our old and complete line of

**YALE CABINET LOCKS.**

**THE YALE & TOWNE M'F'G CO.,**

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.



The only question is

## Is it Le Page's?

If it is you have made a sale. **HUNDREDS of THOUSANDS of PLEASED and SATISFIED CUSTOMERS** testify to the merits of

**~LE PAGE'S LIQUID GLUE.~**

If you sell it you do not have to **WASTE ANY TIME** in answering questions as to its quality.

The people **KNOW** that **LE PAGE'S GLUE** is the **BEST**. They have used it for years and have proved our claims to be true.

**It is the only Glue made WITHOUT ACIDS.**

A dealer who regards his time as worth anything will not risk losing his **CUSTOMERS' CONFIDENCE** by trying to sell something which is **CLAIMED** to be "just as strong" and "just as good as LePage's."

Don't let your customers go to another store for what they want, but **SELL THEM WHAT THEY ASK FOR.**

We can furnish original and attractive advertising matter for "**LE PAGE'S GLUE**" upon request.

**SEND FOR CIRCULARS AND PRICE-LIST.**

**RUSSIA CEMENT CO.,** Gloucester, Mass.

NEW YORK OFFICE, 95 Reade and 113 Chambers Streets.

PACIFIC COAST OFFICE, 23 Davis St., San Francisco, Cal.

## This is the "SALEM" HANGER,

A BRAND NEW  
ARTICLE OF  
"BUILDERS'  
HARDWARE,"

AND WE WANT THE HARDWARE TRADE TO WRITE  
US FOR SAMPLE AND PRICES.



Write us for Sample.

The W. A. South Co., Salem, Mass.

### NEW ADJUSTABLE BENCH LEVEL.

WITH GROUND AND GRADUATED VIAL.

4-6 and 8 inch.



Three Sizes.

MANUFACTURED BY

**C. F. RICHARDSON & SON,**

ATHOL, MASS.



**WM. KROGSrud,**  
Engraver and Die Sinker,  
61 Fulton St., N. Y.  
Manufacturer of  
**STEEL STAMPS**  
For Every Purpose.  
Steel Letters and Figures.  
Burning Brands, Stencils,  
&c. Send for Illustrated  
Catalogue



**CHAS. W. HOEFIC,**

ENGRAVER AND DIE SINKER,

52 FULTON ST., - N. Y.

**STEEL STAMPS,**

BRASS DIES, BURNING BRANDS, &c.  
Designs on Steel Finely Executed.

**MARTY FRENCH FOR RATS AND MICE.**

Great Reduction in Price.



On account of the lower rate of duties under the new tariff we are now prepared to furnish all sizes at greatly reduced prices.

Remember we are the **sole importers** of the **genuine Trap**. All others are flimsy and worthless imitations. Get our Quotations.  
**BURDITT & WILLIAMS, Boston, Mass.**

# W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

## Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

## DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

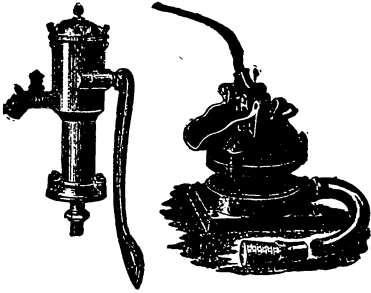
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 209.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by

hand power.

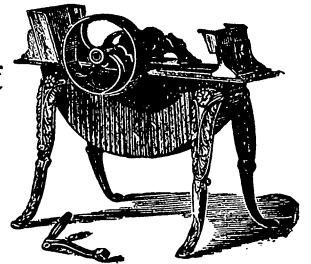
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced. Made either as shown in out for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.



C. I. Grindstone Frame.

**THE DEMING CO.**  
FACTORY SALEM O.U.S.A.  
MANUFACTURERS OF  
HAND & POWER PUMPS, WELL SUPPLIES &c. VERTICAL STEAM PUMPING ENGINES.  
N.Y. OFFICE: 72 JOHN ST.  
HENION & HUBBELL  
GEN'L. WESTERN AGTS.  
55 & 57 N. CLINTON ST.  
CHICAGO, ILL.

## PRENTISS' PAT. VISES.

The Leaders for 20 Years.

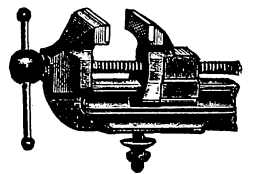
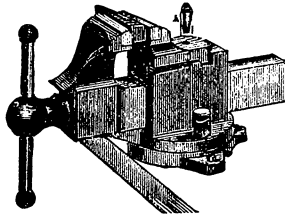
Send for Illustrated Catalogue of

ALL KINDS OF VISES.

PRENTISS VISE COMPANY,

MANUFACTURERS,

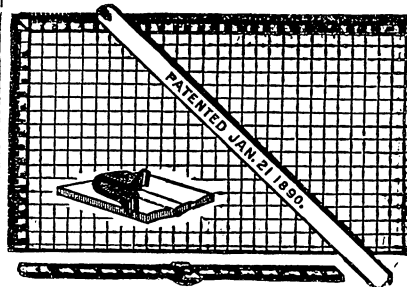
44 Barclay St., New York.



## MYERS & BRO.

**ASHLAND, O.**  
+ CATALOGUES FREE +  
Ashland Pump and Hay Tool Works

The New York Safety Dumb Waiter.  
"The Manhattan Dumb Waiter."  
The Improved Humphrey Hand Elevator.  
Made specially to be sold by Hardware Stores.  
Thousands in use. Catalogues on application.  
**THE STORM MANUFACTURING CO.**  
NEWARK, NEW JERSEY.  
Formerly of Poughkeepsie, New York.



## The Canton Glass Board.

Cuts any Fraction of an Inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

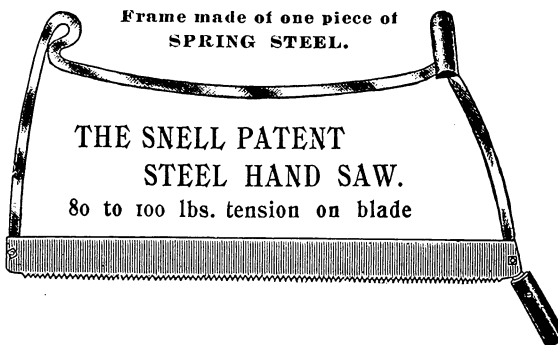
—ALSO—

IMPROVED TRAMMEL RULE for Cutting Circles

From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

Send for Circular.

The Canton Saw Co., Canton, Ohio



Frame made of one piece of SPRING STEEL.

THE SNELL PATENT  
STEEL HAND SAW.

80 to 100 lbs. tension on blade

WILL NOT BEND NOR BREAK.

FACTORY, 330 to 338 First Street, So. Boston.

This saw is always ready for use. Never has to be adjusted after blade is put in. Will last a life-time.

Send for Descriptive Circular and Prices to

**Butler Mfg. Co.,**

P. O. BOX 2180,

BOSTON, MASS.



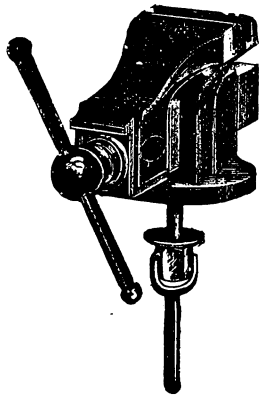
THE TRADE acknowledges our BUTCHERS' STEELS  
make of THE BEST IN THE WORLD.

FOR CATALOGUES AND PRICE-LISTS ADDRESS

C. & A. HOFFMAN, Manufacturers, FRANKFORD, PHILA., PA.



**Athol Machine Co.,**  
Selling Agents.

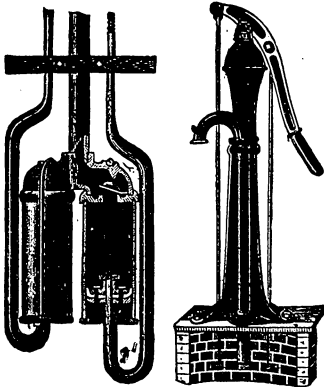


**HOLLANDS' OFFSET JAW VISE.**

Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

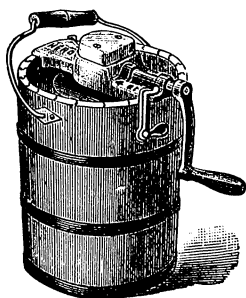
Hollands Mfg. Co.,  
ERIE, PA..  
Manufacturers all styles VISES.

**Peters Double Cylinder Force Pump.**  
EASIEST WORKING PUMP IN THE MARKET.



Will send any responsible dealer a sample to be returned in 30 days if not perfectly satisfactory.

WRITE FOR CIRCULARS AND PRICES.  
PETERS PUMP CO., - KEWANEE, ILL.



**"HERO" ICE CREAM FREEZER.**

Double Action.  
2 qt. to 10 qt.

ALSO  
"Home" Freezer  
2 to 10 qt.,

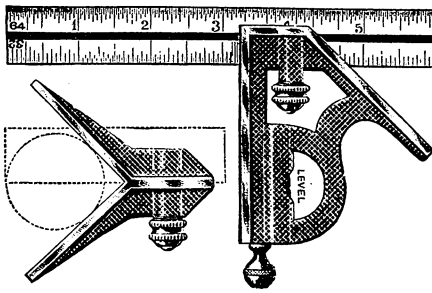
AND  
"Rapid" Freezer  
2 to 40 qt.

**Clement & Dunbar,**  
1129 Beach St., Philadelphia.



### ELECTRIC TELEPHONE

Sold outright, no rent, no royalty. Adapted to City, Village or Country. Needed in every home, shop, store and office. Greatest convenience and best seller on earth.  
**Agents make from \$5 to \$50 per day.**  
One in a residence means a sale to all the neighbors. Fine instruments, no toys, works anywhere, any distance. Complete, ready for use when shipped. Can be put up by any one, never out of order, no repairing, lasts a life time. Warranted. A money maker. Write W. P. Harrison & Co., Clerk 10, Columbus, O.



STARRETT'S  
PATENT

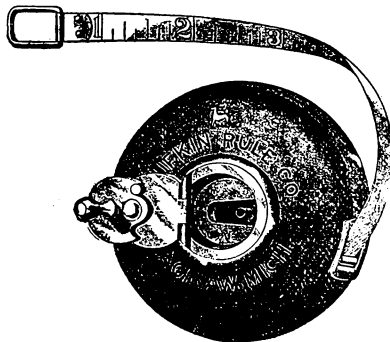
## COMBINATION SQUARE.

Known wherever inches or centimeters are known. No mechanic's tool chest is complete without one, and no hardware store is up to date without a stock of them. Six sizes, 4 inch to 24-inch.

**Send for 80-page Catalogue of Fine Tools.**

LONDON:  
Chas. Churchill & Co. Ltd.  
21 Cross St., Finsbury, E. C.  
BERLIN:  
Schuchardt & Schütte,  
59 Spandauerstrasse.

**THE L. S. STARRETT CO., BOX 55,**  
Athol, Mass., U. S. A.

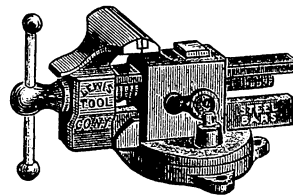


## "RELIABLE" Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval.

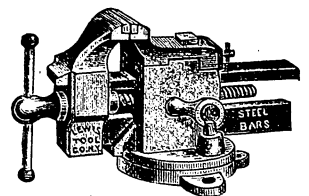
**LUFKIN RULE CO., - SAGINAW, MICH.**  
NEW YORK OFFICE, 2½ MURRAY ST.

## LEWIS' PATENT DOUBLE STEEL SLIDE BAR VISES.



—FOR—  
*All Kinds of Vise Work.*

Send for Illustrated Catalogue.

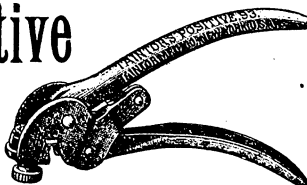


**Lewis Tool Co., 44 Barclay St., New York.**

## WHAT MECHANICS THINK OF THE Taintor Positive Saw Set 93.

ANN ARBOR, MICH., May 5, '94.  
I have given the Taintor Saw Set a thorough trial on both coarse and fine saws and find that it works like a charm. As you have named it "Positive," I think you struck the right name, for it is certainly a set that can't be beat.  
Yours truly,  
A. JONES.

MASON CITY, ILL., May 7, 1894.  
I have given the Taintor Saw Set a good trial. I find it is perfect. It will do all your circulars claim for it. It sets a saw to perfection, and has no weak points about it. I can recommend it to all carpenters. They should add it to their kit of tools.  
Yours very respectfully,  
THOS. H. TACKLESON.



THE BRADY MANUFACTURING Co.,  
Engineers and Contractors,  
BROOKLYN, N. Y.,  
Sept. 20, 1894.  
TAINTOR MFG. Co., New York.  
GENTLEMEN: It is my opinion that, everything considered, a better Saw Set than your 93 pattern will never be made.  
JAMES BRADY, Manager.

SHAW, ORE., Sept. 10, 1894.  
TAINTOR MFG. Co.  
GENTS: I have given the Taintor Saw Set a good trial and found it perfect, and I recommended it to the carpenters here.  
J. F. RIEGSECKER.

SPRINGFIELD, MASS.,  
Oct. 8, 1894.  
TAINTOR MFG. Co.  
I have given the Set several trials, and especially on one saw that I could not set with a lever set. I had to take a strike set and go over it several times in order to get the desired set, but your Saw Set gives it the desired set to perfection, and I freely recommend it to mechanics who like to have an even and uniform set.  
Respectfully yours,  
J. W. FOSTER.

Sole Agents:  
**Wiebusch & Hilger, Ltd.**  
84 & 86 Chambers Street,  
NEW YORK, U. S. A.

GEO. N. CLEMSON, Pres.

S. S. BATTIN, Vice-Pres.

ROBERT J. JOHNSON, Treas.

F. B. EARLE, Sec.

# THE NATIONAL SAW CO.,

OPERATING

Wheeler, Madden & Clemson Mfg Co., Wood-rough & McParlin, Richardson Brothers, Harvey W. Peace Co., Monhagen Steel Works, Wood-rough & Clemson, Pennsylvania Saw Co.

SEND FOR PRICE-LIST.

GENERAL OFFICE:  
NEWARK, - - New Jersey.

# SAWS

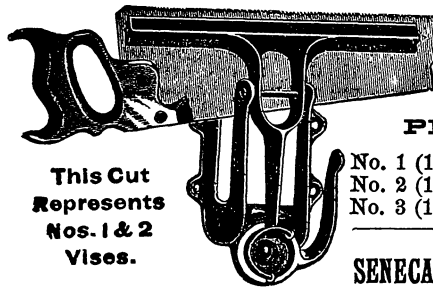
## WENTWORTH'S PATENT NOISELESS SAW VISES,

WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.

Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.



This Cut  
Represents  
Nos. 1 & 2  
Vises.

## PRICE LIST.

No. 1 (11 inch Jaws),	-	\$15.00
No. 2 (15 inch Jaws),	-	21.00
No. 3 (11 inch Jaws),	-	18.00

## LIBERAL DISCOUNT TO THE TRADE.

LONGEST JAWS, HEAVIEST AND  
BEST FINISHED.  
Sold by all leading jobbers of gen-  
eral Hardware at Factory Prices.

—MANUFACTURED BY—

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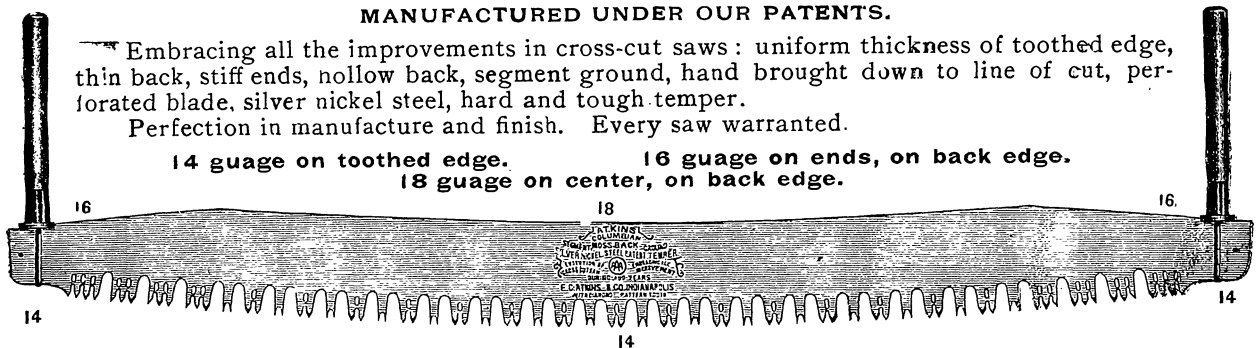
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14 guage on toothed edge.

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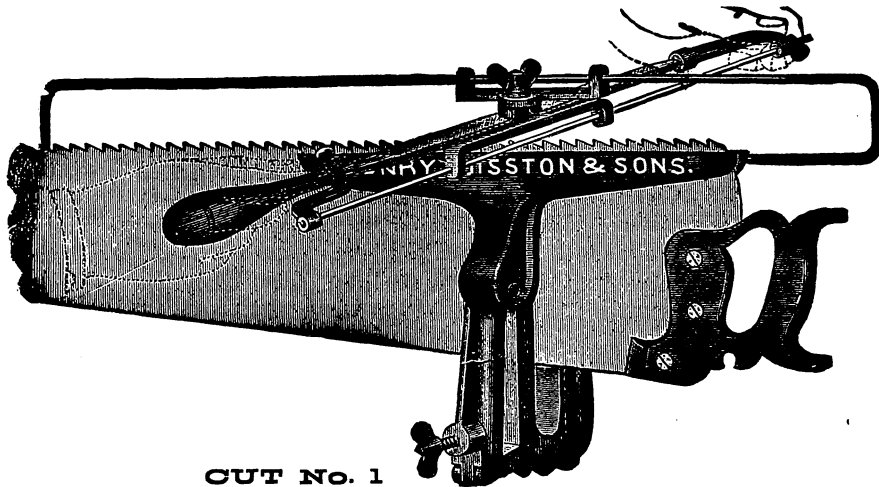
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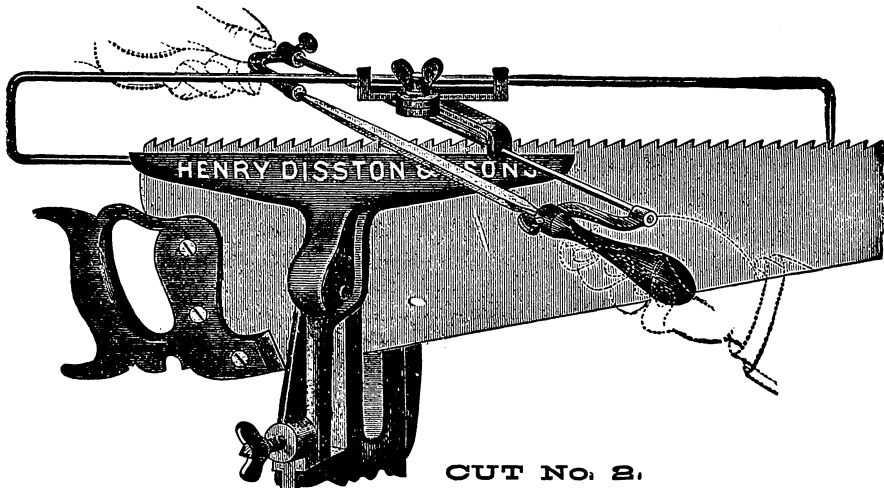
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART  
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Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.


This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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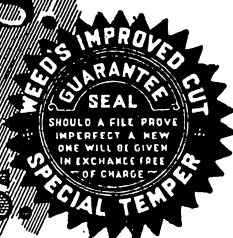


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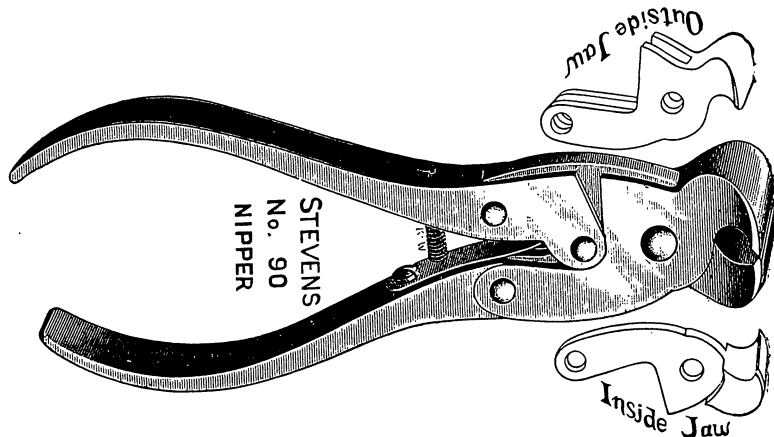
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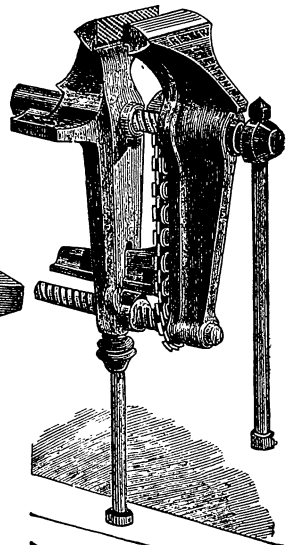
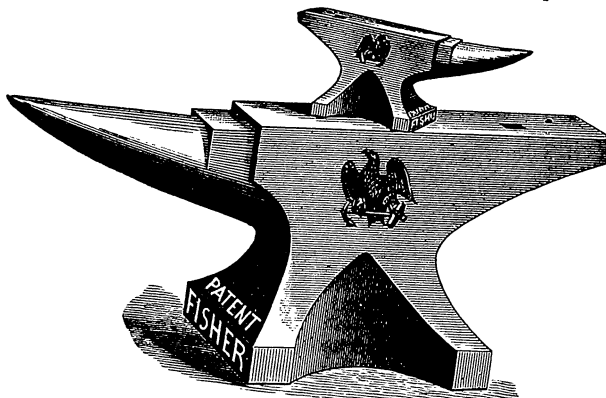
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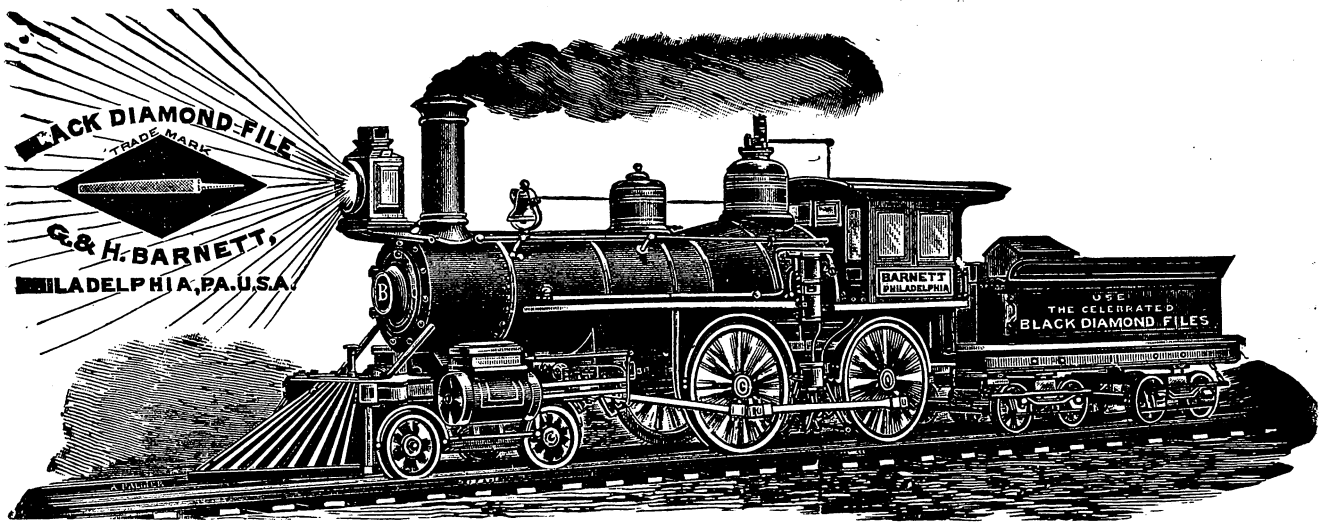
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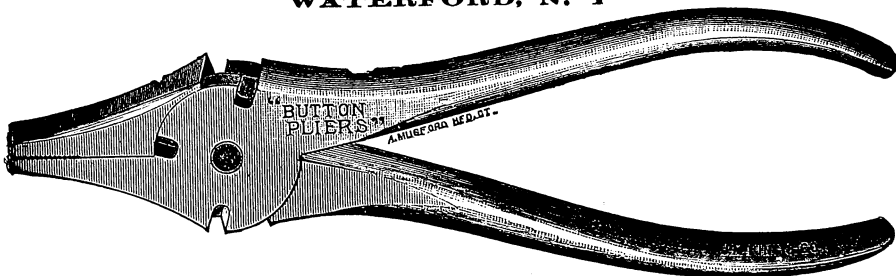
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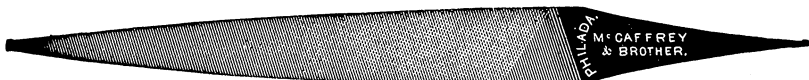
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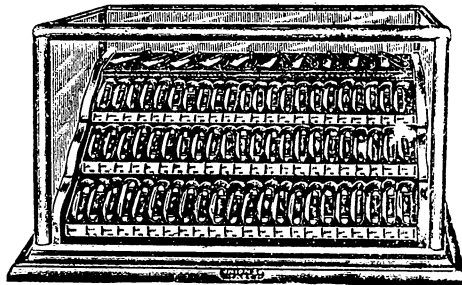
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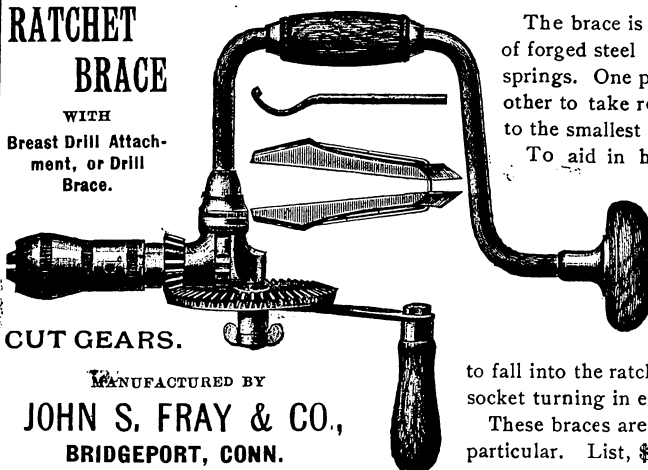
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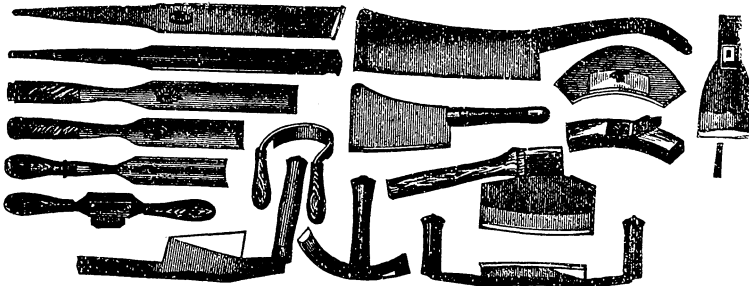
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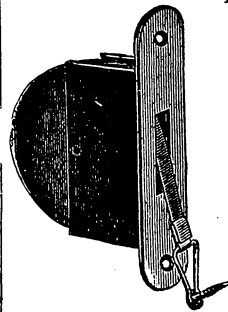
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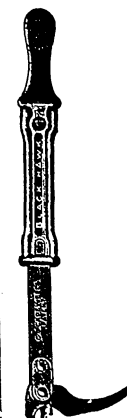
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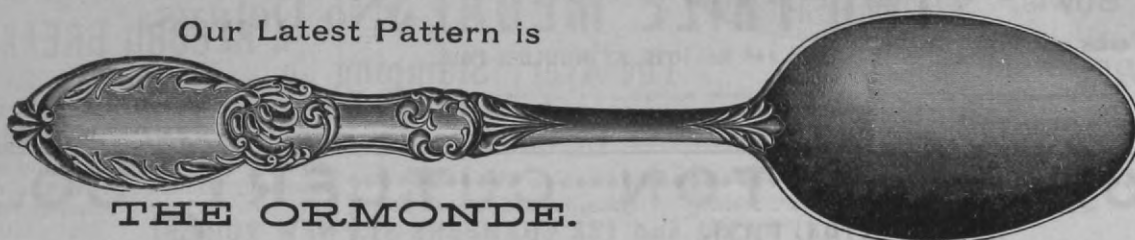
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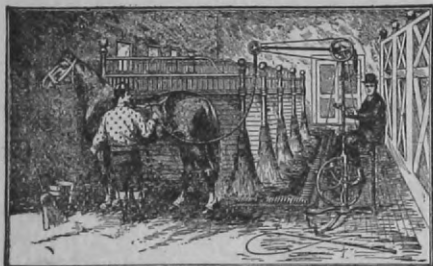
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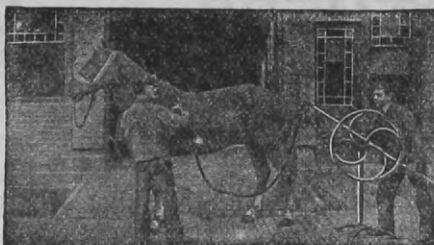
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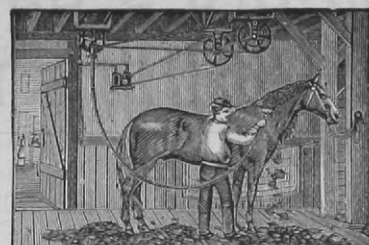
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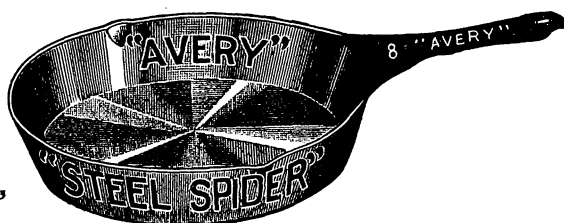


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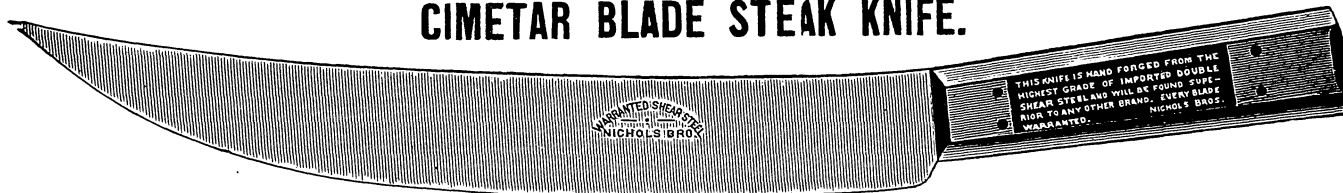
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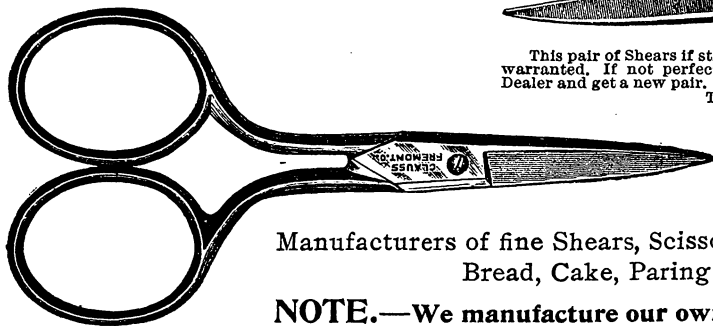
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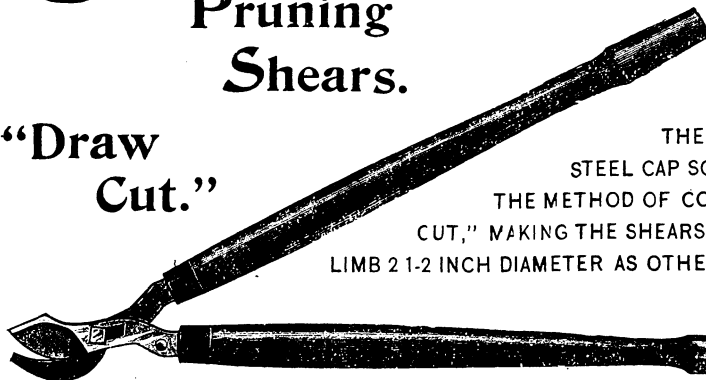
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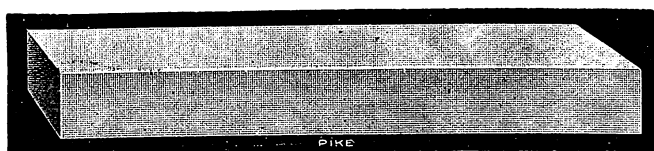
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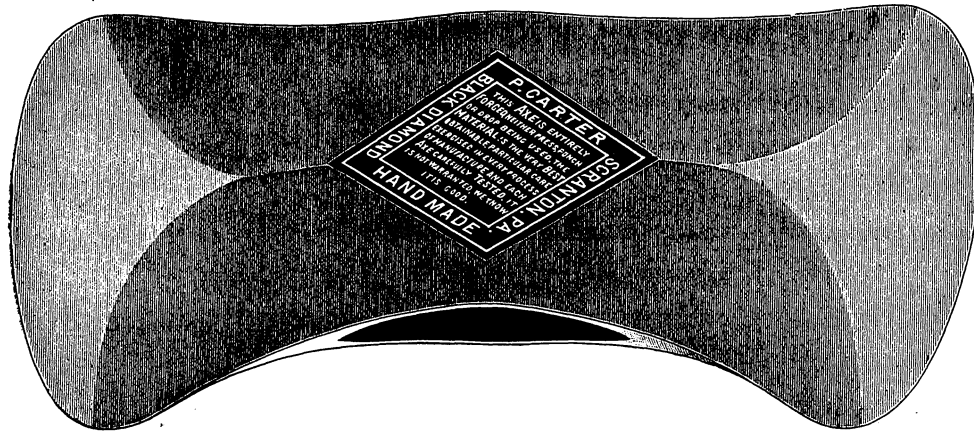
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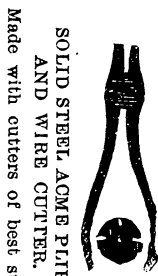
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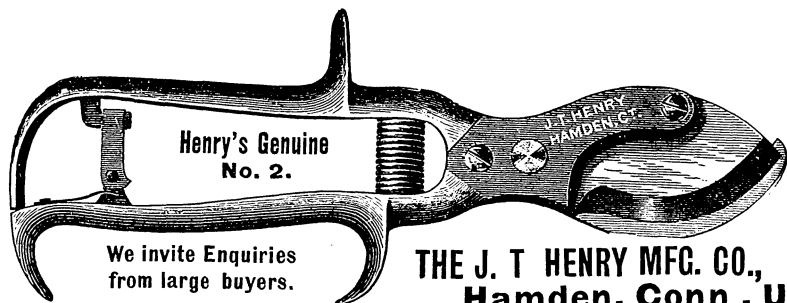
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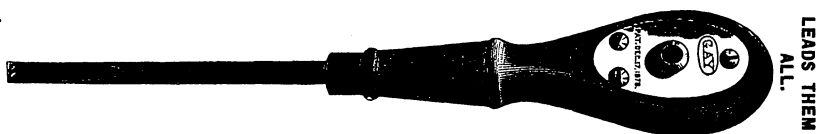
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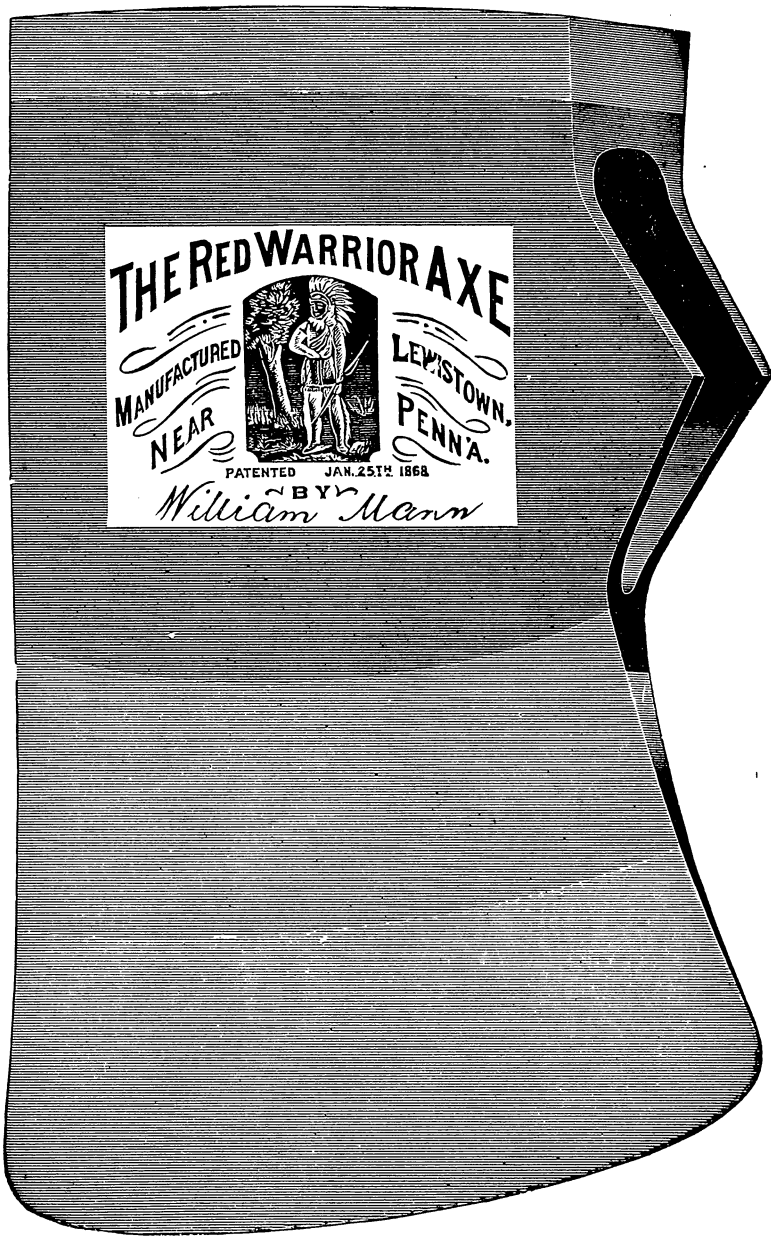
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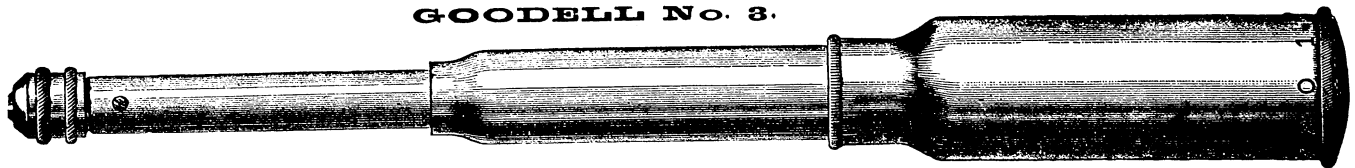
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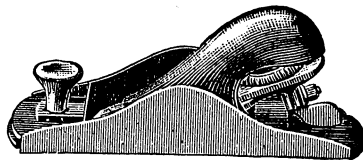
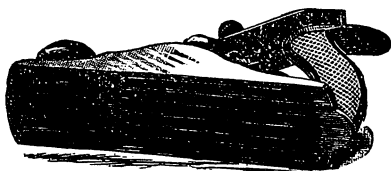
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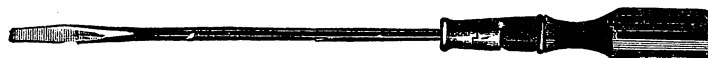
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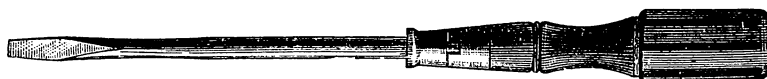
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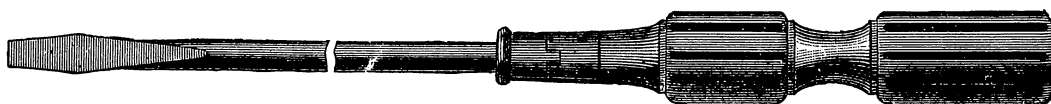
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the Best  
Possible Grip.



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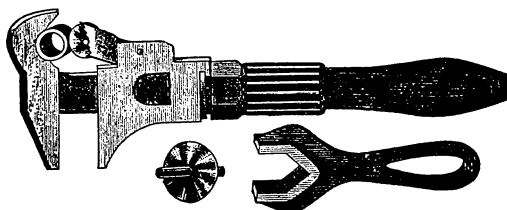


CHAMPION SCREW DRIVER.

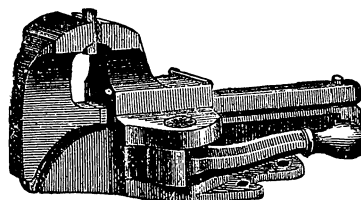


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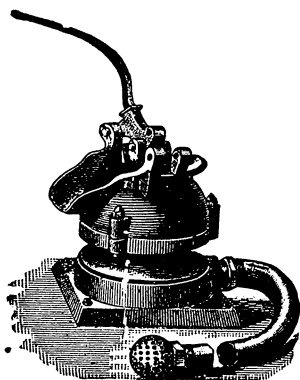
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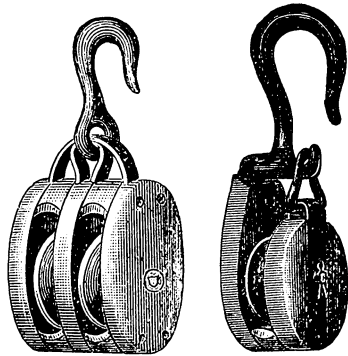
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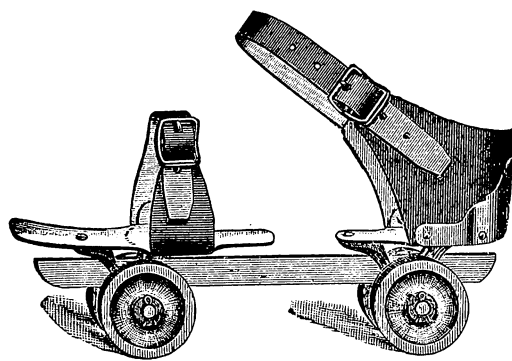
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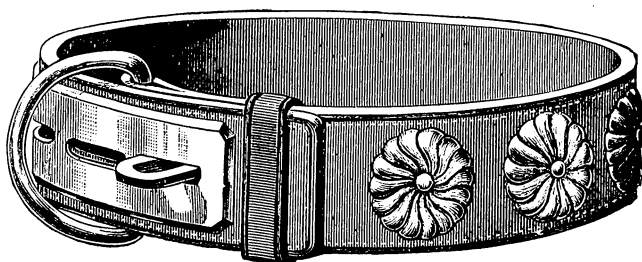
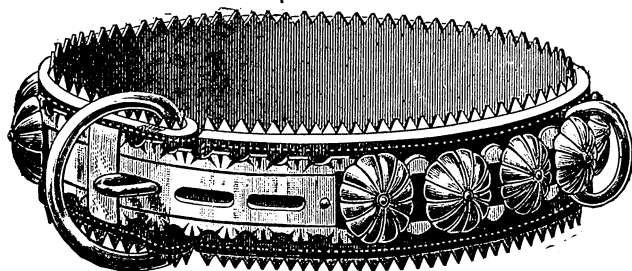
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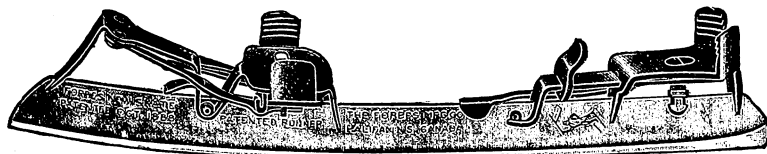
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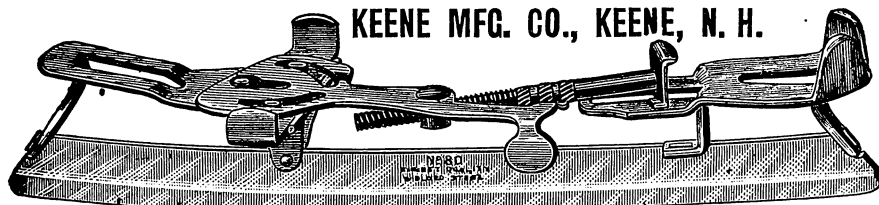
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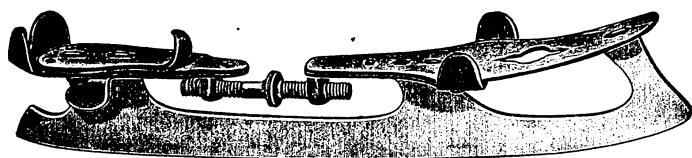
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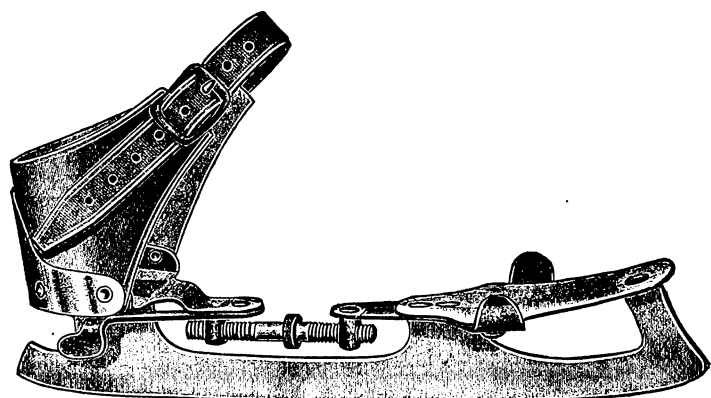
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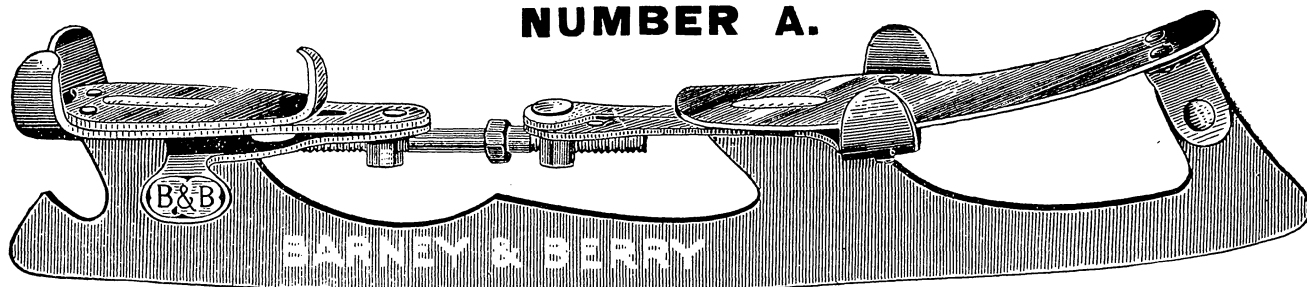
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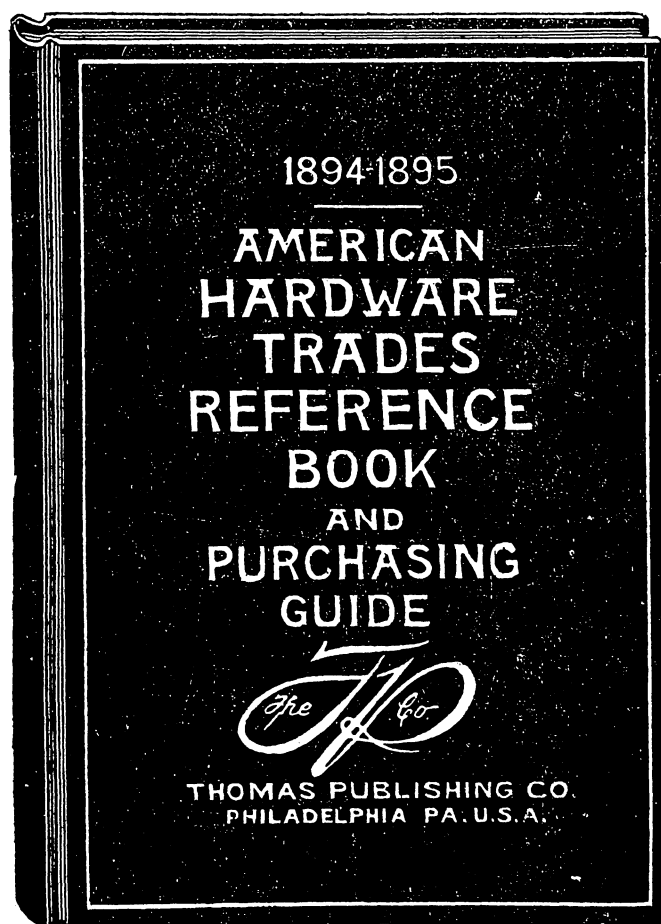
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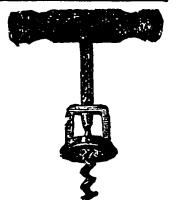
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## ARCTIC ICE DOGS.

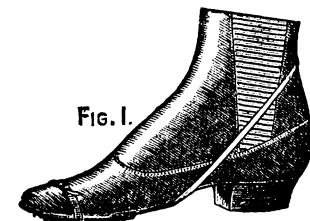
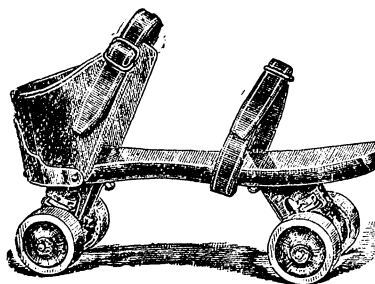


Fig. 1.

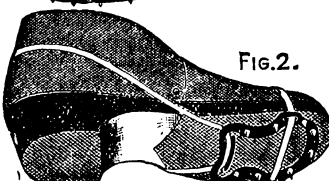


Fig. 2.

These Ice Dogs, or Creepers, designed to secure safe footing on slippery pavements, are the simplest and best ever invented. They consist of a very light, malleable casting of the best quality of iron, fitted for the sole of the shoe and fastened to the foot by means of a toe-strap and an endless elastic band drawn high over the heel, thus holding the dog to its place, and being easy of adjustment, is very quickly put on or taken off.

There are two sizes, for ladies and gentlemen respectively, and the peculiar adjustment attaches them equally well to boots, shoes or rubbers, without difficulty or delay.

Retail at 50c. per pair. Liberal discount to dealers.

PATENTED AND SOLD BY

GEORGE A. WALLER,

SENECA FALLS, N. Y.



# MONARCH BICYCLES

WILL STAND MORE HARD WEAR THAN ANY OTHER  
BICYCLE ON THE AMERICAN MARKET. HARDWARE  
DEALERS FIND MONARCH WHEELS A PROFITABLE  
ADDITION TO THEIR BUSINESS.

GET in line  
for 1895  
with the  
BEST BICYCLE  
of the  
AGE.



HIGHEST  
possible  
GRADE  
in every  
PARTICULAR.  
Fully  
GUARANTEED.

Weights from 18 to 25 lbs.

Many Special Features for 1895.

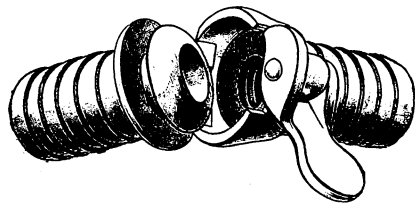
Write for Terms and Territory.

## Monarch Cycle Co.,

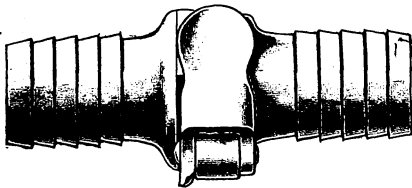
EASTERN BRANCH:  
No. 97 and 99 Reade St., New York.  
The C. F. GUYON CO. (LIMITED), Managers.

FACTORY AND MAIN OFFICE:  
Lake and Halsted Sts., Chicago, Ill.  
Retail Salesroom, No. 280 Wabash Ave.

# A Good Thing—Push it Along.

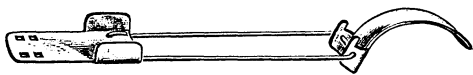


No. 2. DISCONNECTED. No. 1.



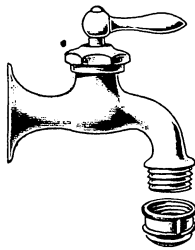
CONNECTED.

Nos. 1 and 2 for Fitting New Hose.  
No. 3 Goes on Faucet and on Hose with Old Screw Coupling.  
" 4 " " Nozzles " " " " " "



THE ADAMS &amp; WESTLAKE

## LIGHTNING HOSE COUPLER AND HOSE BAND.



Simplest thing on earth. Lightning in operation. Perfectly water tight. No bruised fingers. No profanity. Can be coupled by a child. Can be used with old style screw couplers. Made of brass. Will last for years.



No. 3.



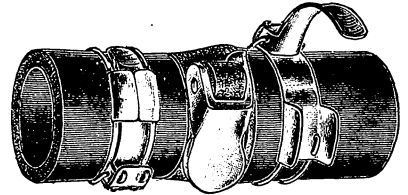
No. 4.

The A. &amp; W. Hose Band.

No Special Tools Required.

QUICK and Effective.

A GOOD THING—  
PUSH IT ALONG.



THE ADAMS & WESTLAKE CO., - CHICAGO.



## Dangler Electric Torches

FOR  
GASOLINE  
OR  
OIL  
14 JETS OF LIGHT

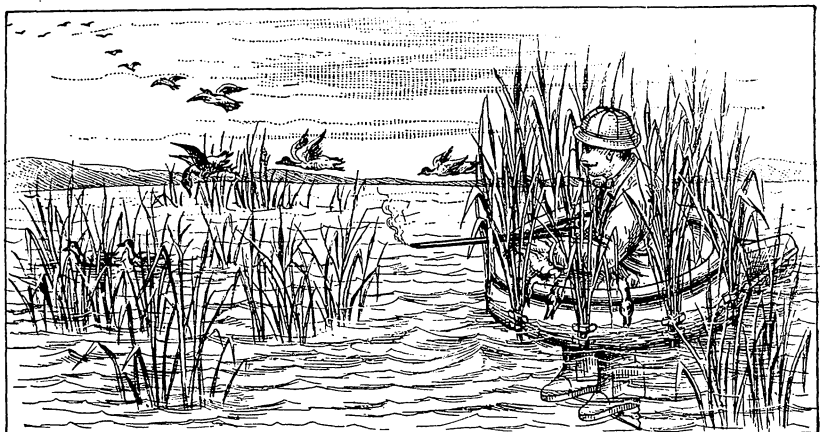
3 to 6  
INCHES  
LONG.

FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas.

SOLE MANUFACTURERS,

The Dangler Stove & Mfg. Co.,  
Cleveland, Ohio.

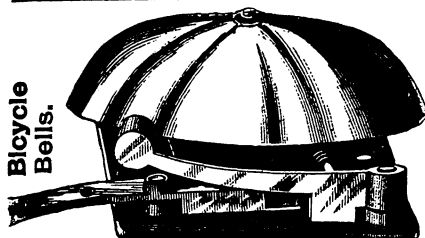
## The Layman Pneumatic Sporting Boat. Life Preserver and Boat Combined.



A lighter, safer and more convenient boat than was ever before on the market; it weighs but fifteen pounds; is easily collapsed and folded into a small package; absolutely safe in any waters; propelled by the feet thus leaving the hands free to use gun or rod; made in four compartments, of the best rubber duck cloth; has loops for erecting a blind to shield you from the game; is quickly inflated, and in every way a success. Send for Catalogue and Price List.

Made and sold by the Goodyear Rubber Co., 487 Broadway, to whom you can send check and they will forward goods. We have our headquarters with them.

AMERICAN RUBBER BOAT CO., New York.



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BEVIN BROS. MFG. CO., Easthampton, Conn.,  
Manufacturers of

Sleigh Bells, House Tea Hand, Gong Bells, &c.

## Yacht AND Boat Hardware.

L. W. FERDINAND & CO.,  
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Before.



After.

## Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloon to their original shape and length.

It removes all **WRINKLES** and **BAGGING AT THE KNEES**, giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

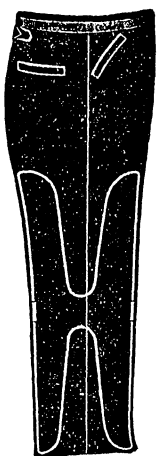
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

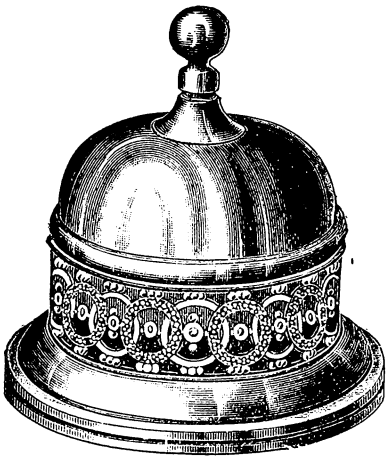
COVERT MFG. CO., West Troy, N. Y.



# NEW DEPARTURE TEA AND OFFICE BELLS.

## JUST THE ARTICLE FOR THE HOLIDAY TRADE.

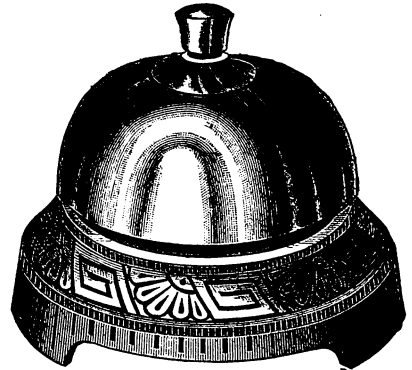
### ELECTRICAL RESULTS WITHOUT A BATTERY.



**TEA** Diameter of Gongs, 2½ Inches.  
**BELLS.** Diameter of Bases, 3½ Inches  
**OFFICE** Diameter of Gongs, 3½ Inches.  
**BELLS.** Diameter of Bases, 4½ Inches.

Superior Bell Metal Gongs, Nickel Plated.  
 Solid Bronze Bases Finished in Nickel Plate,  
 Natural Bronze or Old Copper.

Superior Bell Metal Gong.  
 Solid Bronze Base.  
 Quadruple Silver Plate.  
 Diameter of Gong, 3 Inches.  
 Diameter of Base, 4 Inches.



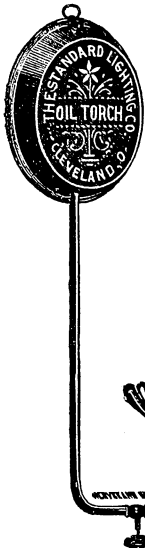
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113 Chambers Street, New York.

# LIGHT YOUR DARK SHOPS CHEAPLY.

Give your men plenty of Light and they will do double work.

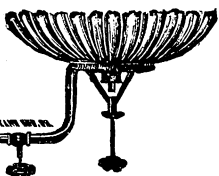


The Wall Torch has been used for several years as a means of illumination in Mills, Foundries, Machine and Car Shops, Tunnels, Street Stands, Band Stands, Smith Shops, etc.

While there are many cheap, inferior torches made which injure the sale of a good article, and condemn the Torch in general, our "Incandescent" Wall Torches are recognized as the best, and are now in use in the largest manufacturing establishments in the country giving **PERFECT SATISFACTION**, as is evidenced by the **DUPLICATE ORDERS** we receive from year to year.

They burn 150° Coal Oil, or 74° Naphtha, requiring a different burner for each.

In ordering be careful to state which is desired.



Price, for Single Torch, complete, \$2 each.

SPECIAL PRICE QUOTED FOR QUANTITIES.

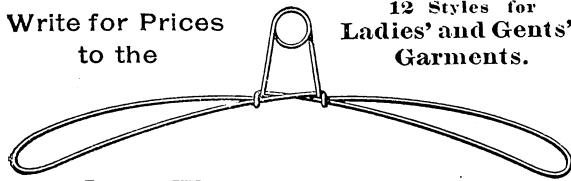
**THE STANDARD LIGHTING CO.,**

100 to 118 Perkins Ave., - - - Cleveland, Ohio,

Write for Prices  
to the

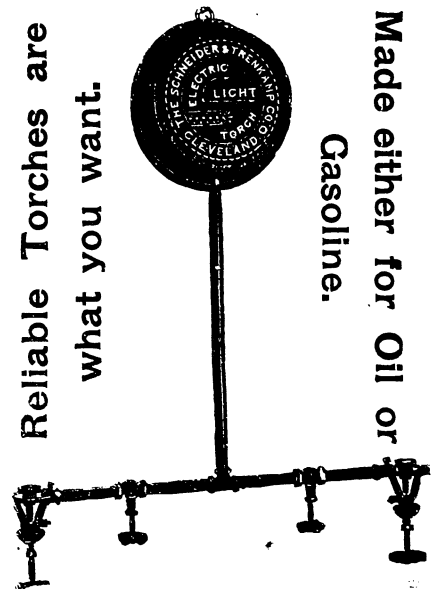
12 Styles for  
Ladies' and Gents' Garments.

**"Wire  
Hangers."**



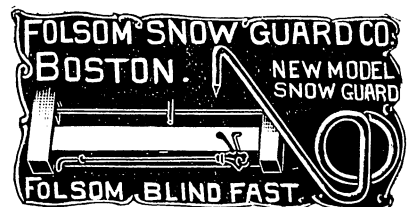
**Barber-Koenig Mfg. Co.,** No. 119 NORTH VINE ST., HAZLETON, PA.

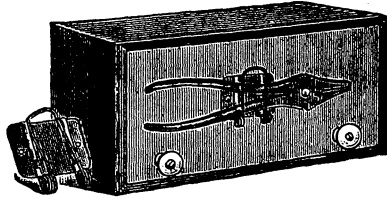
Reliable Torches are  
what you want.



Made either for Oil or  
Gasoline.

These Torches are particularly adapted for use in factories, foundries, machine shops, rolling mills, blacksmith shops, warehouses, etc. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by **THE SCHNEIDER & TRENKAMP CO.** Nos. 479 to 497 Case Ave., Cleveland, Ohio.





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**SHOW**

Your goods by sample. Save time and avoid loss from shopworn samples by using Thompson's Sample Holder.

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Write for prices or send 5c. for a sample.

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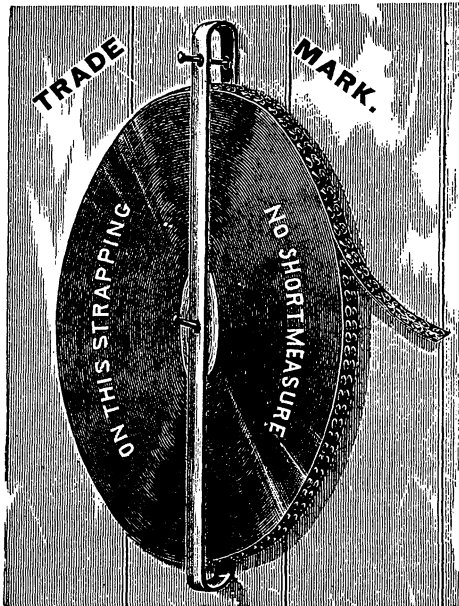
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for strap iron for binding packing cases. Made in four widths, half inch to one inch wide. Saves time and waste.

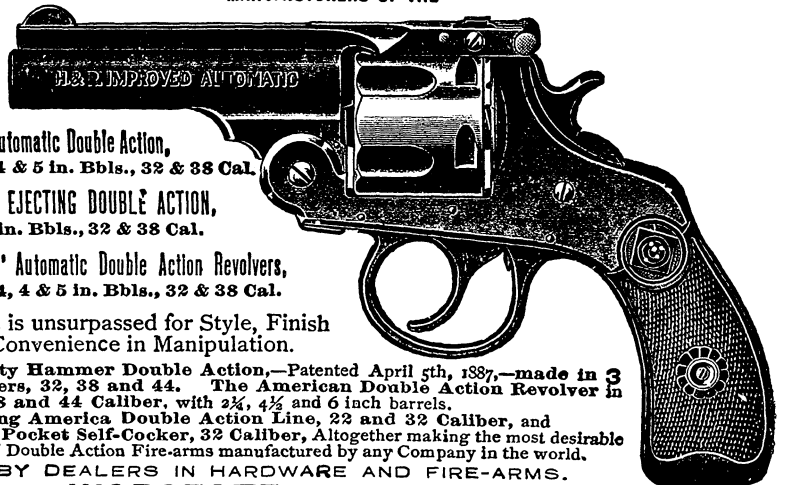
Mention *Iron Age*.**CARY MFG. CO.,**

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MANUFACTURERS OF THE



Improved Automatic Double Action,  
3 1-4, 4 & 5 in. Bbls., 32 & 38 Cal.

IMPROVED EJECTING DOUBLE ACTION,  
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"Premier" Automatic Double Action Revolvers,  
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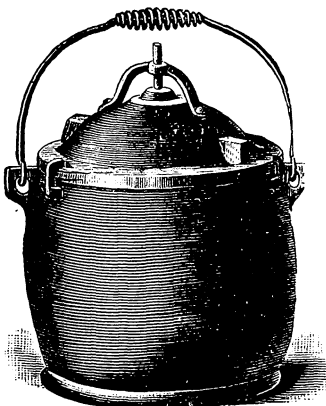
This line is unsurpassed for Style, Finish and Convenience in Manipulation.

The Safety Hammer Double Action,—Patented April 5th, 1887,—made in 3 Calibers, 32, 38 and 44. The American Double Action Revolver in 32, 38 and 44 Caliber, with 2 1/4, 4 1/2 and 6 inch barrels.

The Young America Double Action Line, 22 and 32 Caliber, and The Vest Pocket Self-Cocker, 32 Caliber, Altogether making the most desirable line of Double Action Fire-arms manufactured by any Company in the world.

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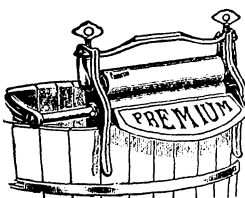
Either Tinned or Enameled, with steam valve and covers ground to fit tightly. The aroma is saved. The only practical mode of making delicious soups. They extract all of the marrow from the bone.

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SPECIAL GOODS TO ORDER.

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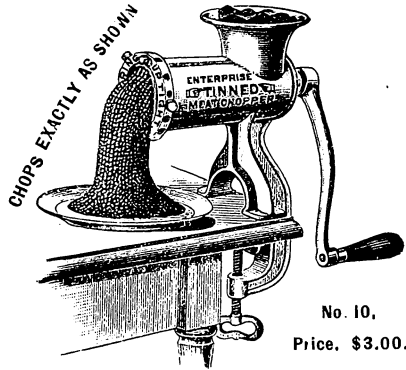
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**Premium Wringer,**

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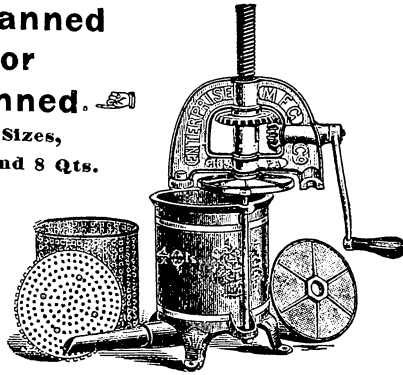
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**Japanned  
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3 Sizes,  
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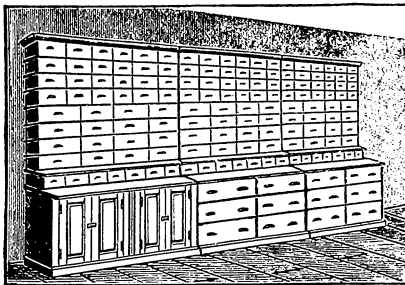
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HARDWARE  
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THE WERNICKE SYSTEM  
OF STORE FIXTURES.

It is new, novel and unequalled for beauty  
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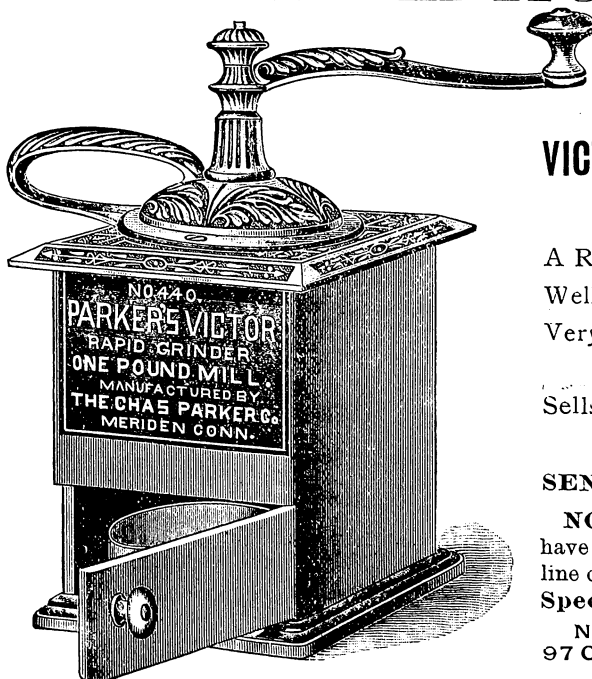
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**THE WERNICKE CO.,**

Manufacturers of General Store, Bank and Office Furniture,

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THE PARKER GUN VISES THE PARKER LAMP  
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Just The Thing!

## PARKER'S VICTOR ONE POUND COFFEE MILL.

A Rapid Grinder.  
Well Made Throughout.  
Very Attractive in Appearance.  
Sells Readily at a Popular Price.

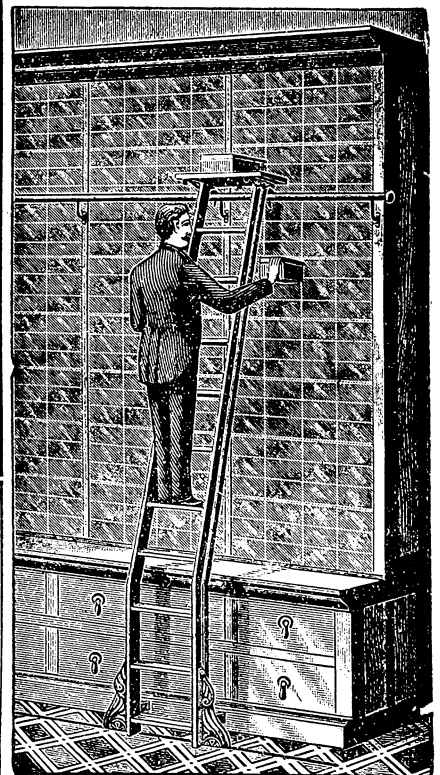
SEND FOR DISCOUNT.

NOTE.—Every dealer should have our catalogue of extensive line of Standard Hardware Specialties.

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## THE BICYCLE STEP LADDER.

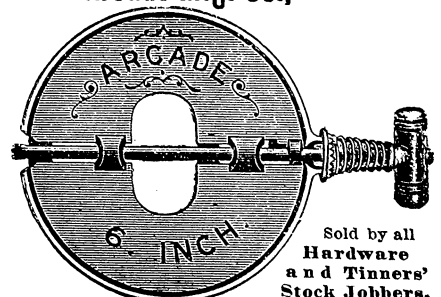
Especially adapted for Hardware Stores.



The newest, neatest, simplest, easiest operated and safest store ladder made. Highest Award World's Fair. Write us.

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Sold by all  
Hardware  
and Tinnerns'  
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People will want screens and they will want the best.

**"We don't say we are Democrats,"** but we are in shape to furnish **the best** at the prices of inferior goods. In other words, **Republican goods at Democratic prices!**

**Nursed by the Tariff**, if it were not for our competitors, we would have **the monopoly of the screen business**. Canadians pay 30% duty and buy our goods; so, even if our government had cut down the tariff on screens, **in order to reduce the surplus**, we would still be a monopoly, if it were not for our competitors.

However, the common people of America have been able to buy over four millions of Phillips' screens and to enjoy **comfort unknown to our ancestors or to the common people of other countries**.

This has enabled us to grow from a small beginning to a capacity of 5,000 screens per day, by originating desirable patterns and making reliable goods.

You will want to see

## Our New "Flyer" Window Screen.

(Without center bars or wings.)

## Our New "Northwest" Window Screen Frame.

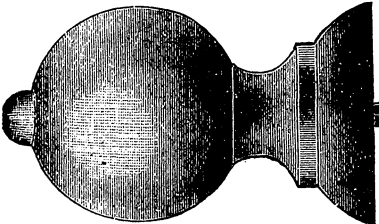
(With pressed steel corner plates.)

## Our New "Standard Oil" Screen Door.

(The cheapest of decent fancy doors.)

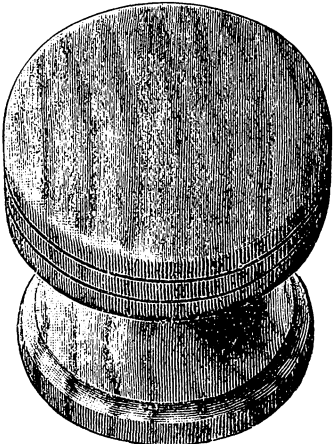
All of which will be illustrated and described in the first January number of *The Iron Age*.

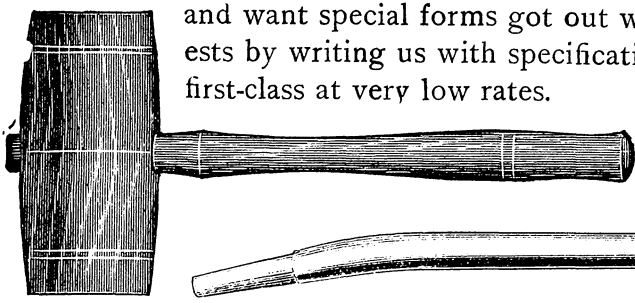
**THE A. J. PHILLIPS CO.,** - **Fenton, Mich.**




## THE Piqua Handle & Mfg. Co.,

Manufacturers and Dealers who desire to use or sell anything in the line of Farming Tool Handles, Garden Rakes, Natural Wood Lock Furniture, Base Knobs, Electric Push Buttons or anything in the Handle line and want special forms got out will serve their best interests by writing us with specifications. We turn out work first-class at very low rates.





**PIQUA, O.**



**JOS. LAY & CO.**

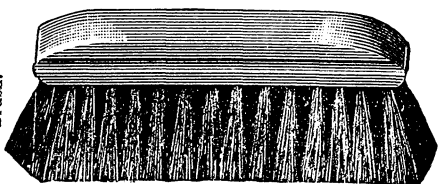
**RIDGEVILLE,  
INDIANA,**

—MANUFACTURERS OF—



No. 10 Hard Molders' Brush.

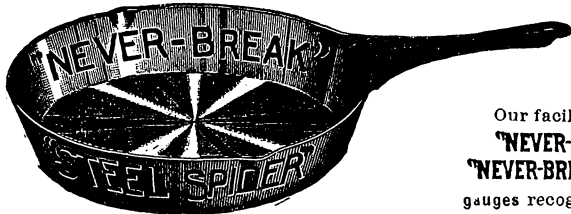
No. 8 Soft Molders' Brush.



Hard and Soft Molders' Brushes, Steel Wire Casting Brushes, Stable, Shop, Street, Boat and Carpet Brushes, Brooms and Brushes of all kinds.

**HIGH GRADE.**

**LOW PRICED.**



## "NEVER-BREAK" Steelware.

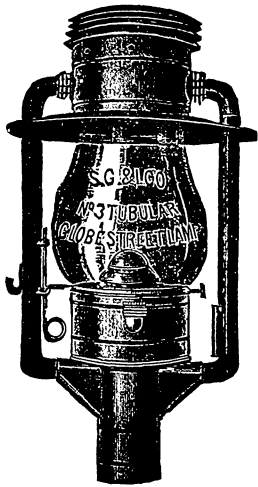
The "STANDARD" for Weight, Finish and Price.

Our facilities are such that we can make immediate shipments.

"NEVER-BREAK" Spiders and Griddles are all made of 14 Stubbs' English Gauge and all "NEVER-BREAK" Kettles and other deep ware of 16 Stubbs' English Gauge. These are the only gauges recognized by the United States Government and the trade as "Standard."

**THE BRONSON SUPPLY CO.,**  
NEW YORK AND CLEVELAND.

Steel Spiders, Griddles, Kettles, Maslins, Scotch Bowls, etc. Send for Catalogue and Discounts.



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Globe Street Lamp.

## Light your Streets and Driveways. The S. G. & L. CO. Tubular Globe Street Lamp

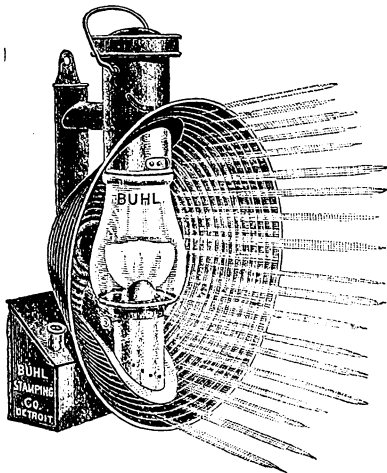
IS THE Best Street Lamp Manufactured.  
Equal to the best Gas Light.  
Will not Blow Out in the Strongest Wind.  
Will not Smoke.  
Will not Freeze.  
Automatic Extinguisher.  
Outside Wick Regulator.  
Will Burn Four Hours for One Cent.

MANUFACTURED BY

**STEAM GAUGE AND LANTERN CO.,**

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



We can fill orders on the day they are received for

### BUHL TUBULAR HEADLIGHTS

No. 15 New Side Lift Lanterns.

No. 20 Buhl Top " " "

No. 200 " " " "

The Celebrated Buhl Dash Reflector Lanterns.

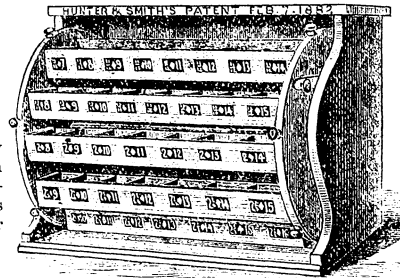
Every Buhl Lantern is tested before it leaves our factory. Construction and quality guaranteed. Send for our complete illustrated catalogue.

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Practical, Durable, Convenient, Neat, Low Priced. Screw Case holds 89 gross. Bolt Case 55 sizes. Can be set on counter or ledge in the wing. We also make a Combination Case that holds 53 gross of screws and 28 packages of bolts, just what the average dealer wants. Write for trade price.

THE SMITH BROS. HDW. CO., Columbus, O.



## We are Sole Manufacturers of the Celebrated Erie and King Wringers.

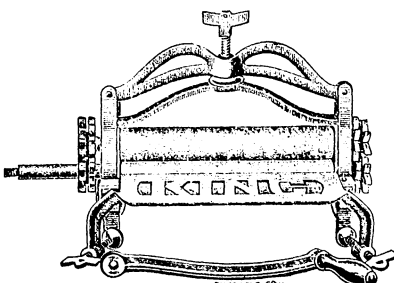
We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

**THE NATIONAL WRINGER CO.,** CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.



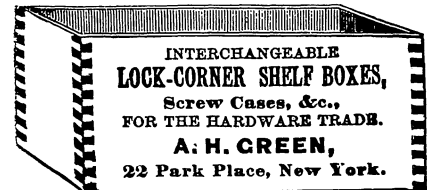
## THE ADAMS ART AUGER BIT, PATENTED,



Does plain and art work in great variety. It will pay you to send for an 8-8 Bit with two shanks. Sent on receipt of \$1. Price-list and circular free.

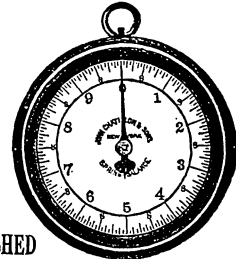
A. L. ADAMS.

Bridgeport, Ct.



## John Chatillon & Sons,

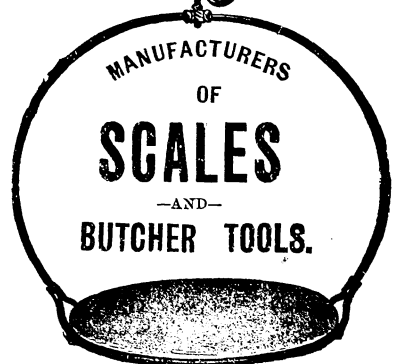
85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



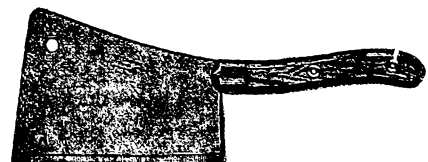
ESTABLISHED

1835.

SEND FOR  
PRICE-LIST

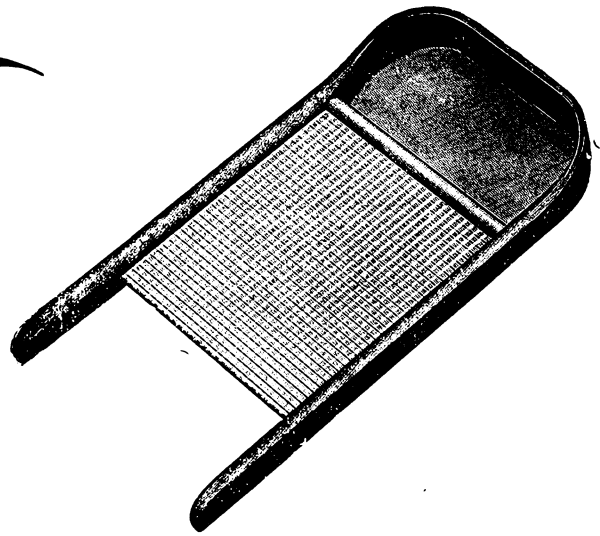
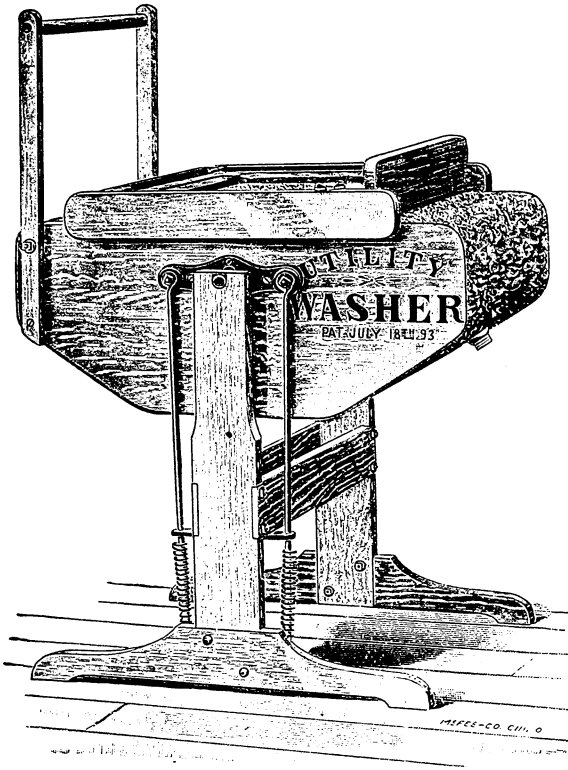


Sole Agents for  
**Foster Bros.' Butchers' Cutlery.**



John Chatillon & Sons, N. Y.

# Utility

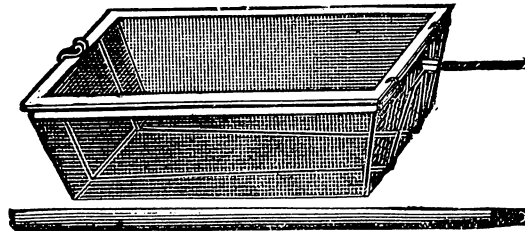
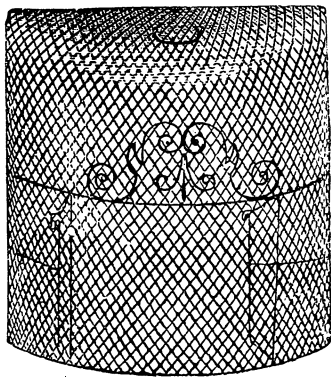


## Washer and Board

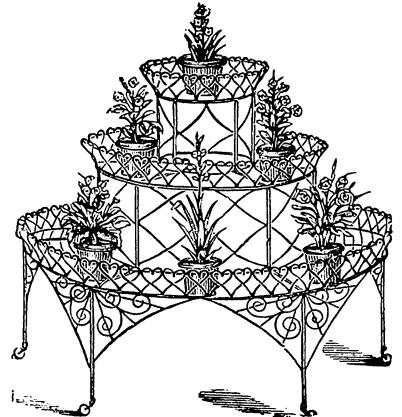
Your customers can get along without both but neither separately. The washer has the peculiarity of washing the clothes clean and not wear out either it or the operator. While the board is something entirely new yet thoroughly tested and proven the best made. Write for prices, please.

**Olds Wagon Works,**  
Fort Wayne, Ind., U. S. A.

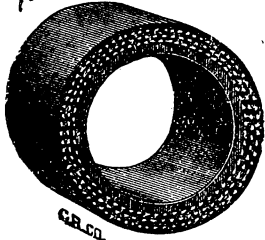
**THE FRED. J. MEYERS MFG. CO.,** HAMILTON OHIO,



MANUFACTURERS OF  
Wire Guards, Corn Poppers, Flower Stands,  
Sieves, Screens, Bank and Office Wire  
Work, Railing of every description.  
FIRST CLASS GOODS. LOW PRICES.  
F. J. MATTISON, Eastern Agt., 69 Beekman St., N. Y.



NEW SEAMLESS TUBE



## Who Has Not Had Bad Hose ?

Who has not lost time, patience, money, by attempting settlement for such goods ?

**THE CAUSE** in nine cases out of ten is the lapped seam.  
**THE REMEDY** is in buying our

### PATENT SEAMLESS TUBE HOSE,

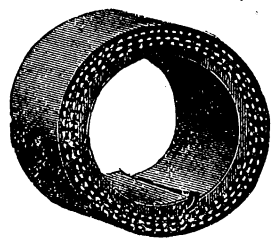
made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers' Cotton Hose, &c.  
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

**CLEVELAND RUBBER WORKS**  
of the Mechanical Rubber Co.,  
CLEVELAND, O.

Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

OLD LAPPED TUBE



**SALES OF**  
Over Two Million Feet  
—OF—

#### GARDEN HOSE

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

We were awarded an order for 25,000 ft. for World's Fair of our celebrated  
**Seamless-Tube**  
COTTON RUBBER-LINED HOSE

**We Want Your Trade.**  
Send for 60-page Catalogue.  
Write for Prices and Samples.

# IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

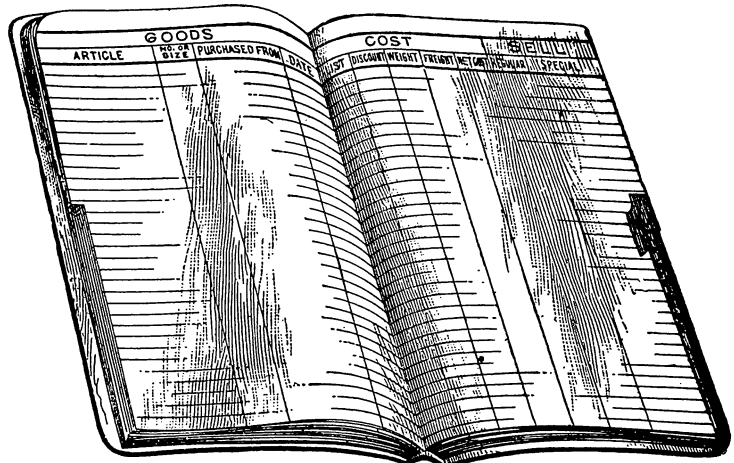
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

## FOUR EDITIONS:

A, 200 pages, - - - - -	\$1.00
A F, 200 pages with flap, - - - - -	1.25
A 2, 400 pages, - - - - -	1.50
A F 2, 400 pages with flap, - - - - -	1.75



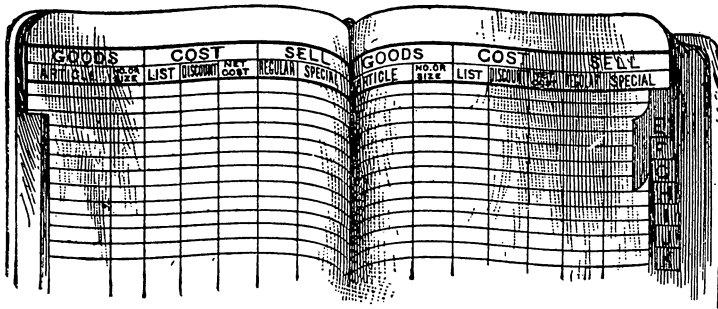
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

## FOUR EDITIONS:

B, 200 pages - - - - -	\$1.00
B F, 200 pages with flap, - - - - -	1.25
B 2, 400 pages, - - - - -	1.50
B F 2, 400 pages with flap, - - - - -	1.75



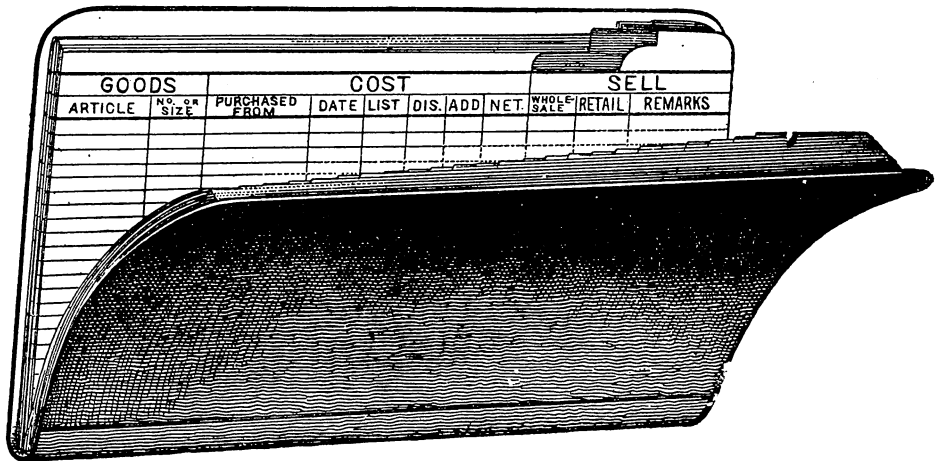
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

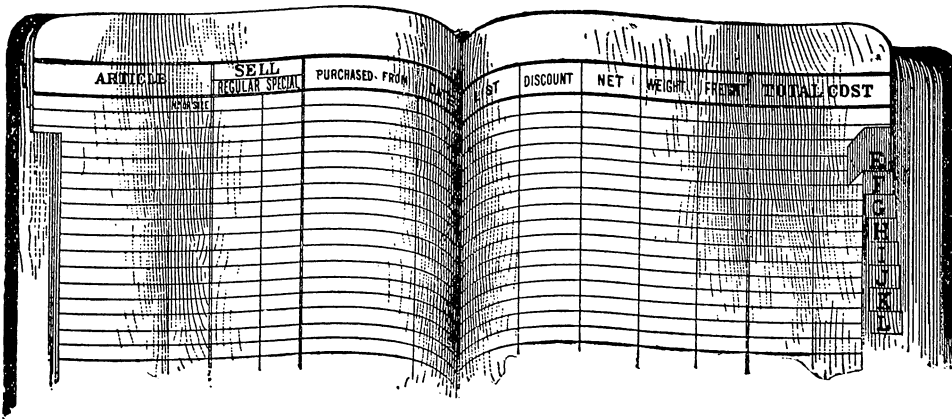
Size, 4½ x 7½ in.; grain seal leather.

## FOUR EDITIONS.

C, 200 pages, - - - - -	\$1.00
C F, 200 pages with flap, - - - - -	1.25
C 2, 400 pages, - - - - -	1.50
C F 2, 400 pages with flap, - - - - -	1.75



Hardware Price Book C.



Hardware Price Book D.

Arrangement is adapted to the requirements of the trade in this direction.

Size 5¼ x 8 in.; grain seal leather.

FOUR EDITIONS.	D, 200 pages, - - - - -	\$2.00	D 2, 400 pages, - - - - -	\$3.00
	D F, 200 pages, with flap, - - - - -	2.50	D F 2, 400 pages, with flap, - - - - -	3.50

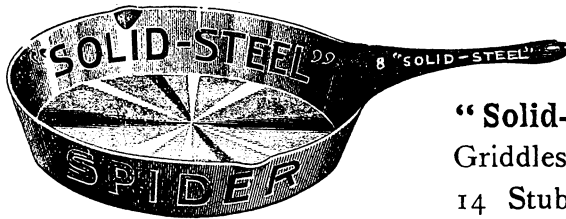
Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement is adapted to the requirements of the trade in this direction.

Sent, post-paid, on receipt of price by **DAVID WILLIAMS, Publisher, 96-102 Reade St., New York**

# WE MAKE

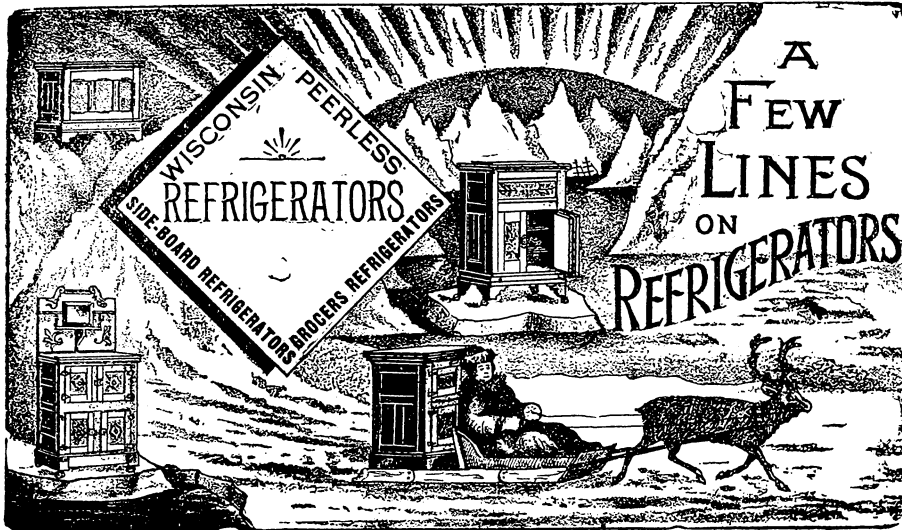
SPIDERS,  
GRIDDLES,  
KETTLES,  
SCOTCH BOWLS,  
MASLINS,  
STEW PANS,  
STEW POTS,  
BROILERS,  
&c.. &c.



"Solid-Steel" Spiders and Griddles are pressed **HOT** from 14 Stubbs' Gauge Steel and guaranteed not to warp.

**THE CLEVELAND STAMPING & TOOL CO.,**  
CLEVELAND, OHIO.

Light and Heavy Stamping and Blanking, Dies and Presses.



## FROM DEALERS LOOKING FOR THE Best Refrigerator Made

We solicit an opportunity of presenting the merits of our  
"Wisconsin Peerless."

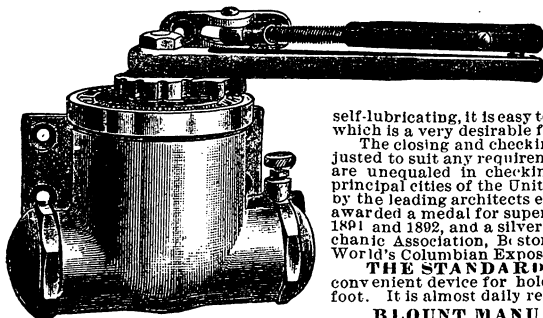
Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.

For Catalogue address

**The Wisconsin Refrigerator Co.**

EAU CLAIRE, WIS.

New England Office,  
175 Hanover Street, BOSTON, MASS.



After five years of extensive use

## The Blount Door Check and Spring

is acknowledged generally to be the best on the market. Being free from packing friction, and its interior parts which is a very desirable feature.

The closing and checking power is under direct control and can be quickly adjusted to suit any requirement. They are made in sizes suitable for any doors, and are unequalled in checking power. There are many thousands in use in all the principal cities of the United States, and in other countries. They are recommended by the leading architects everywhere, and once tried are always used. They were awarded a medal for superior merit by the American Institute in New York, 1890, 1891 and 1892, and a silver medal and diploma by the Massachusetts Charitable Mechanic Association, Boston, 1892, and a medal and diploma for superior merit by World's Columbian Exposition, 1893.

**THE STANDARD DOOR STOP OR HOLDER.** A new, novel, and convenient device for holding doors at any angle desired and operated with the foot. It is almost daily required on public and private doors. Send for circular.

**BLOUNT MANUFACTURING CO., - BOSTON, MASS.**

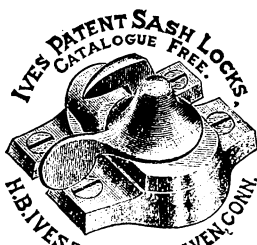


PAT. JAN. 27, 91.

IN USE

## HIGHEST AWARD.

ALWAYS PLEASE.



ALWAYS SELL.

NO OTHER SASH LOCK IS SO WELL UNDERSTOOD OR APPRECIATED BY ARCHITECTS

## MORFORD'S

Latest Improved

## Safety Alarm Cash Tills

Patented July 10, 1894

Size, 17 x 18 inches. Narrow

Counters, Size 13 x 18 inches.

Prices the same for either drawer

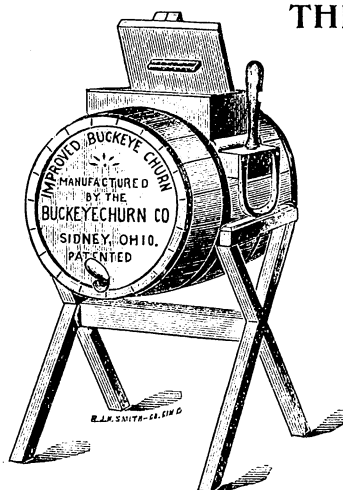
The only Cash Drawer on the market which will give the alarm in either case by pulling the right or the wrong keys. Cannot be tampered with unless giving the alarm.

**THE MORFORD REGISTER CO.,**  
Mfrs. of Cash Tills and Cash Registers,  
ALLENTOWN, PA.



THE

# Buckeye Churn



No Floa's or Paddles.  
Butter by Concussion.  
Only principle for Gran-  
ular Butter.

Large opening. Easy  
to clean and work.  
No drudgery.

**50,000 IN USE.**

Sold to one Dealer in town only.

—THE—

**Buckeye Churn Co., SIDNEY, O.**

# THE CLARK MFG. CO.

Blind Hinges, Gate Hinges, Door Butts,

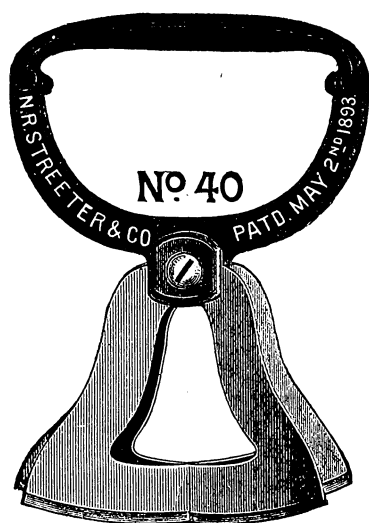
And other **HARDWARE SPECIALTIES,**

**BUFFALO, N. Y.**



# N. R. STREETER & CO.,

Manufacturers of **SAD IRONS AND HARDWARE.**



## "SENSIBLE" MINCING KNIVES.

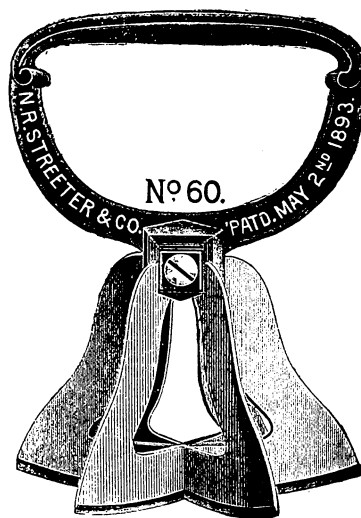
Tempered Steel Nickel-Plated Blades.  
Multiple-Bladed Means Rapid Cutting.

**These goods have become the standard of the market.**

Our line of Sensible Mincing Knives covers all points where other Multiple-Bladed Knives fail.

**BLADES** can be **REMOVED** when they need sharpening. Easy to clean.

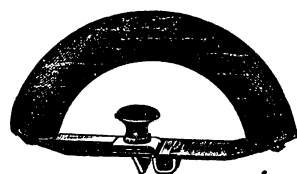
Write for our 1894 Catalogue and get our Prices.



Factories, Rochester, N. Y., Pottstown, Pa.

General Office, Groton, N. Y.

N. Y. Office, W. H. JACOBUS, 90 Chambers St.



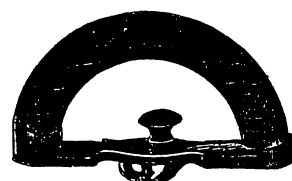
PATENT APPLIED FOR.  
The Steel Stretcher Handle,  
for Mrs. Potts' Sad Irons,  
in Hazel Wood only.  
**No. 110.**

## The Cleveland Wood Turning Co.,

710-726 Scranton Ave., Cleveland, O.

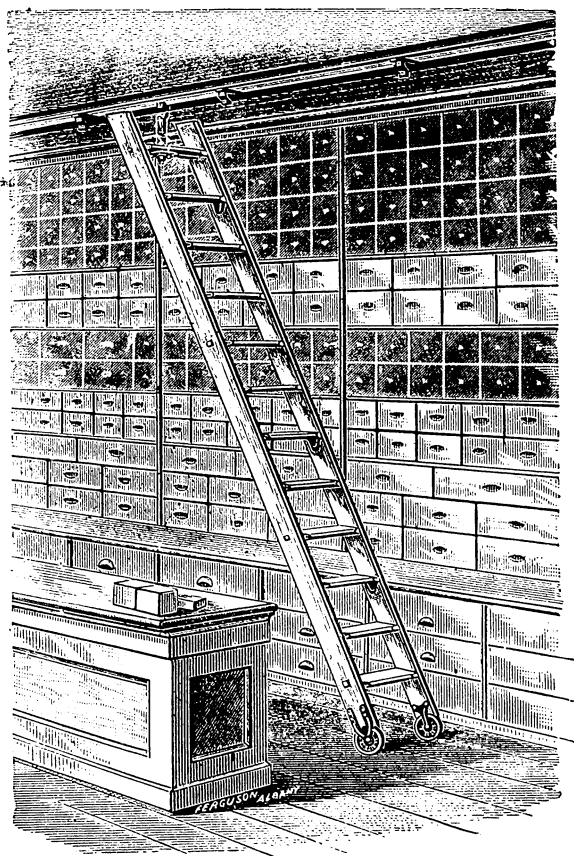
Special work in Handles and Wood Turning of all kinds. Our line of regular made Tool Handles is the best.

New York Office:  
**W. H. JACOBUS,**  
No. 90 Chambers St.



Walnut, Japanned, No. 1.  
Walnut, Tinned, No. 2.  
Hazel, Japanned, No. 10.  
Hazel, Tinned, No. 20.

## THE "NOISELESS" STORE LADDER.



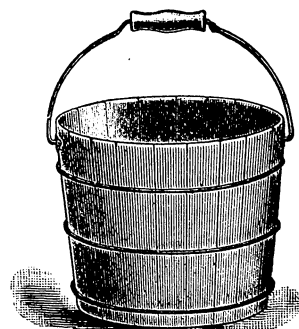
The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

**M. CROISSANT,**

**ALBANY, N. Y.**

## ELECTRIC-WELDED Wire-Hoop Cedar Pail.

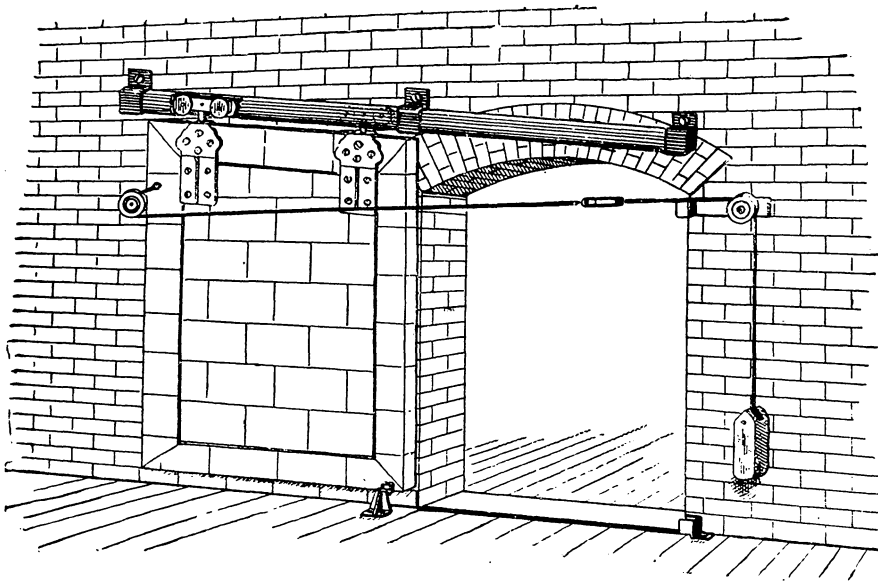


Pat. March 24th, 1891,  
and April 10th, 1894.

Made of best selected **Virginia White Cedar**. Hoops are rust proof, are sunk in grooves, and are **twice** as strong as old style flat hoop. **Impossible** for this pail to fall down. Write for prices and catalogue.

**Richmond Cedar Works**  
Manufacturers of Woodenware,  
**RICHMOND, VA.**

# THE COBURN SELF CLOSING FIRE DOOR.



EQUIPPED WITH AUTOMATIC  
FIRE DOOR FITTINGS.

The only absolutely fireproof runway in the world. This can be applied to brick walls at a less expense to builder than any other device. No woodwork to warp, wear or burn or to protect with a covering of tin. Track cannot be twisted off the wall by excessive heat, and in case of fire the door will hang as long as wall stands, the track being bolted direct to the brick walls. More easy to apply than any other fixture.

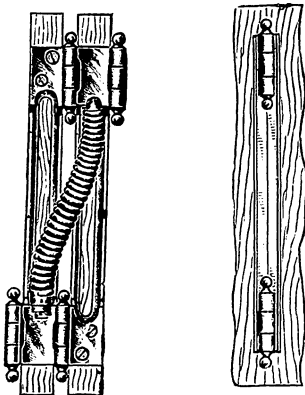
GET our CATALOGUE of  
PARLOR FIRE Door Hangers

— AND —

## TROLLEY STORE LADDERS.

# COBURN TROLLEY TRACK MFG. CO., HOLYOKE, MASS.

New England Agent, L. H. Tourtellotte, No. 94 Pearl St., Boston, Mass.; New York Agents, H. B. Newhall Co., No. 105 Chambers St.; Philadelphia Office, No. 721 Jayne St.; San Francisco Agents, Palace Hardware Co., No. 603 Market St.; Chicago Agents, Orr & Lockett Hardware Co., 50 State St.; St. Louis Agents, Simmons Hardware Co.; New Orleans Agents, Rice-Horn Hardware Co.; Atlanta, Ga., Agents, Kirkpatrick Hardware Co.



Highest Award, World's  
Columbian Exposition,

— ON —

## SPRING BUTTS.

For Catalogue and Prices Address

CHICAGO SPRING BUTT CO.

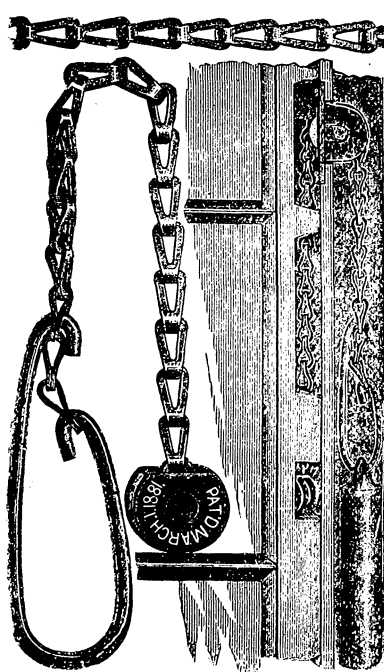
CHICAGO, ILL.,

Or 97 Chambers Street, N. Y.

**Electric Traction on Railways and Tramways.** By A. BEERENZAUN. The author has endeavored in this book to summarize as concisely as possible the present state of electric traction and to describe the various methods and constructive details which are to-day in use or which have marked consecutive steps in the development of the art. 213 illustrations, 12mo, cloth .....\$4.00

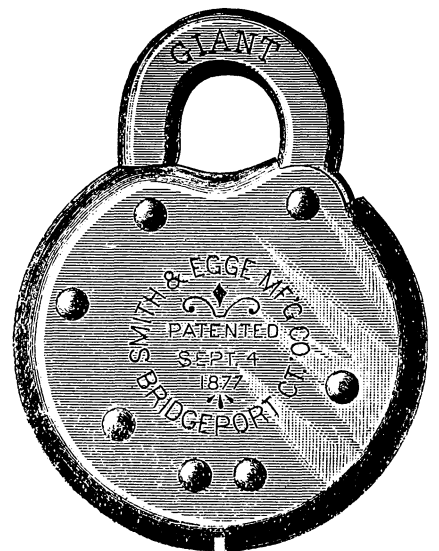
For sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

## THE SMITH & EGGE MFG. CO., BRIDGEPORT, CONN.



### THE GIANT METAL SASH CHAIN

is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."



### THE GIANT PADLOCK.

Centennial Award. "Superior in Every Respect."

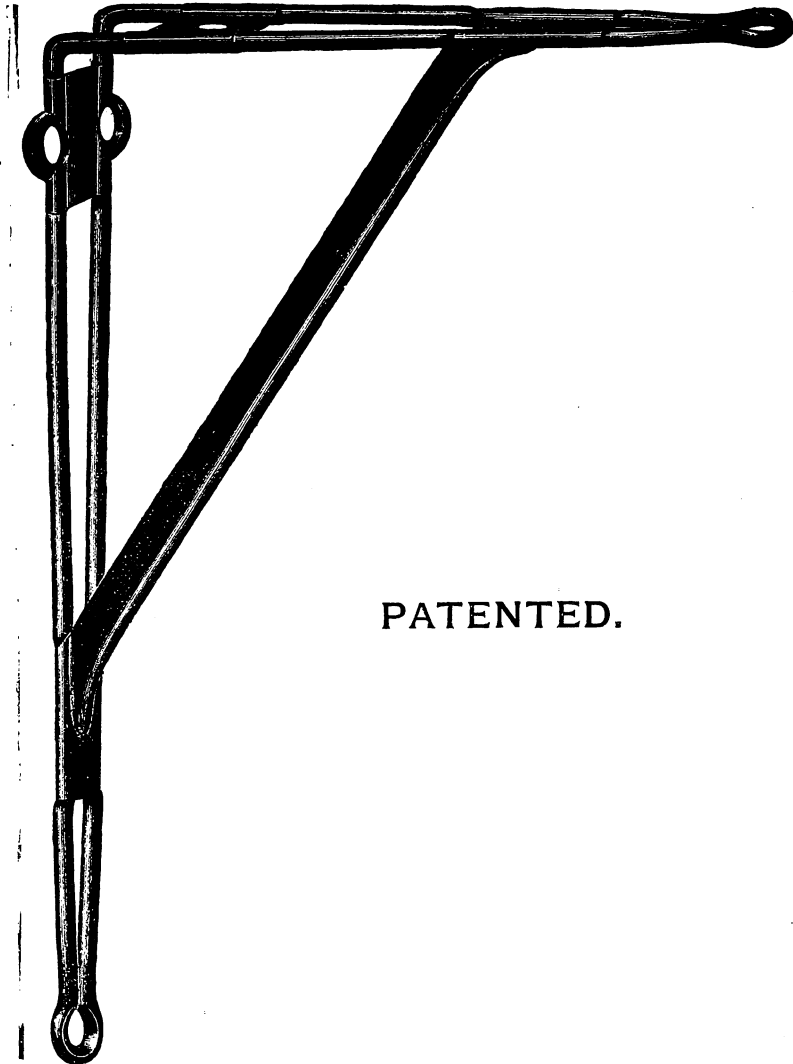
This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

# Bradley Shelf Brackets

Are **LIGHTER** and **STRONGER**

THAN ANYTHING ON THE MARKET.

THEY ARE MADE OF STEEL THROUGHOUT.



PATENTED.

READ  
WHAT  
IS  
CLAIMED:

1. THE BRADLEY BRACKET weighs less than **ONE-HALF** of what any other bracket weighs.
2. It will allow any competing bracket an excess of 100 per cent. in the metal used in its construction, and will then support 20 per cent. more weight.

This remarkable showing is attained without the use of the Central Rib, which has always been an inconvenience in driving the screws, and which is a feature of some of the newer wrought brackets, as also of the old cast brackets.

*THE MANUFACTURERS STAND READY TO VERIFY THE ABOVE CLAIMS.*

BRADLEY BRACKETS are all highly polished before they are japanned, and for finish, durability and true artistic merit are not approached by any.

For Sale by Leading Jobbers in America and Europe.

☞ Be Sure and Get New Goods!

Write Us Before Taking Up Any Other Bracket.

**ATLAS MFG. CO., New Haven, Conn.**

NEW YORK AGENT:

W. H. JACOBUS, 90 Chambers St., New York.

GENERAL REPRESENTATIVE:

C. M. AVERY, 177 Lake St., Chicago.



# READING

## Hardware Company,

—: MANUFACTURERS OF :—

# ARTISTIC

# HARDWARE

FOR

PRIVATE RESIDENCES

AND

PUBLIC BUILDINGS.

“VASSAR”

CYLINDER LOCKS

AND LATCHES,

FOR

FRONT DOORS,

VESTIBULE DOORS,

OFFICE DOORS,

STORE DOORS, Etc.

WAREHOUSES AND SAMPLE ROOMS:

NEW YORK, - - - 96 & 98 Reade Street.

PHILADELPHIA, - - - 514 Commerce Street.

CHICAGO, - - - 73 Wabash Avenue.

FACTORIES: **Reading, Pa.**

# Russell & Erwin Manufacturing Co.,

New Britain, Conn., New York, Philadelphia,  
Baltimore, London.

SOLE MANUFACTURERS OF

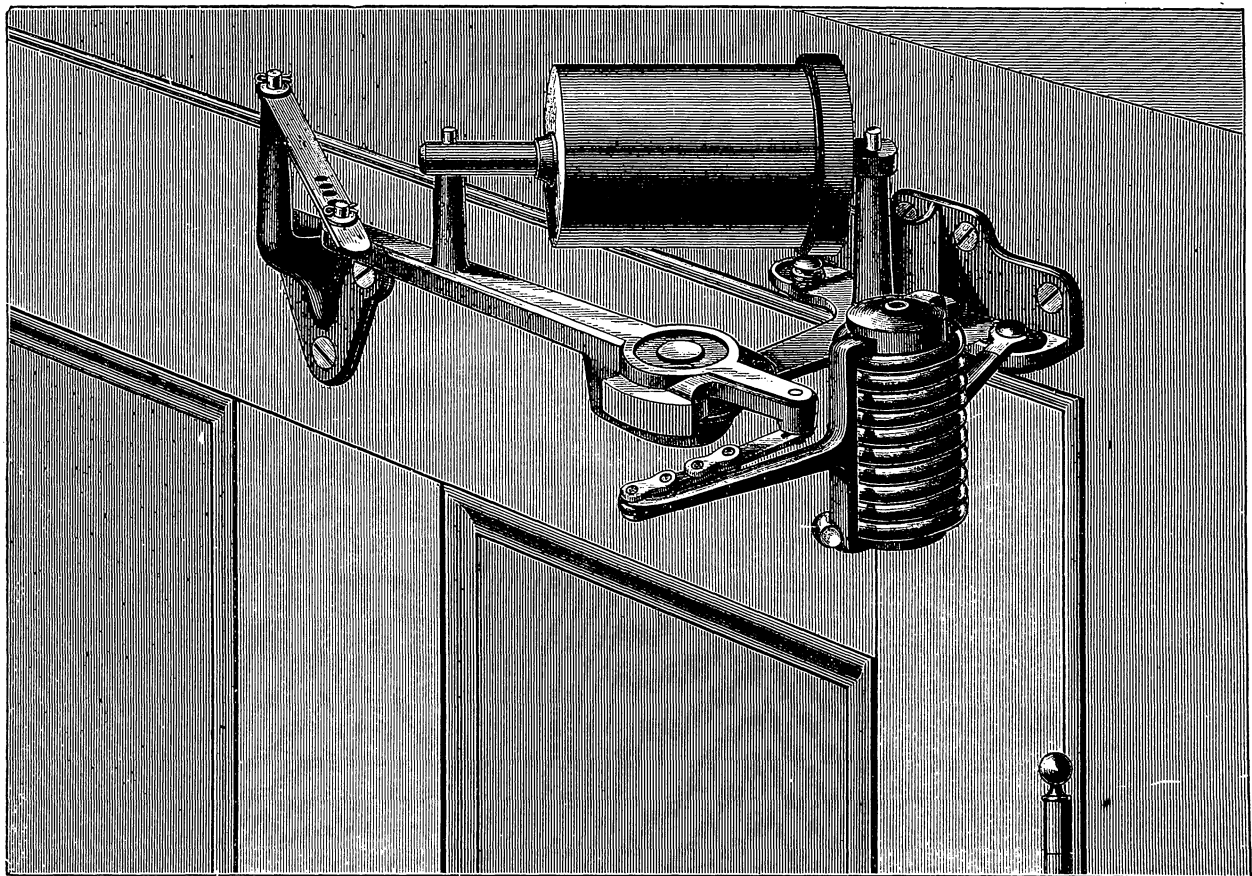
## THE HOME DOOR CHECK and SPRING COMBINED.

—FOR—

### Outside and Inside Car and Screen Doors.

—AND FOR—

### Either Right or Left Hand Doors.



Easily adjusted, simple in construction, durable. In use on many  
railroads, private residences, office and public buildings.

# Russell & Erwin Manufacturing Co.

M



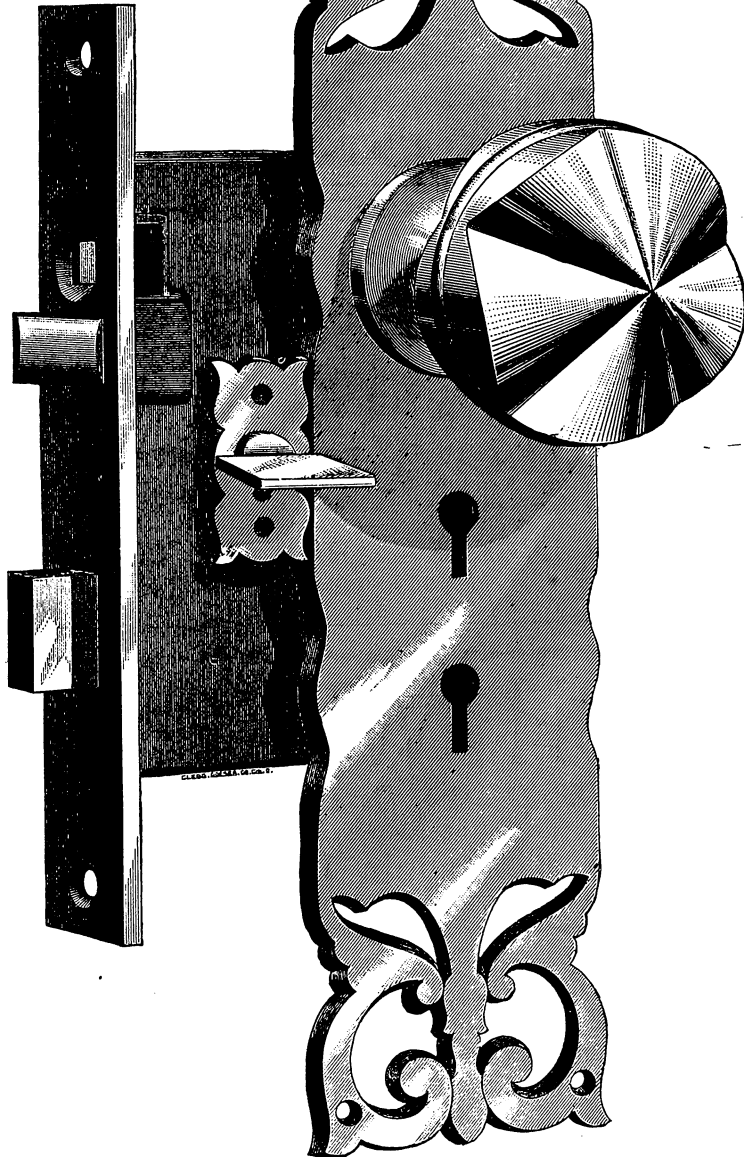
# Changed!

THE Corporate name of this Company being somewhat misleading, in so far as the character of its productions is concerned, has been changed to that given below.

WE not only manufacture a complete line of Door Locks, but also a full line of Builders' Hardware, giving especial attention to Architects' Specifications for special work.

AND in addition are the largest manufacturers of Brass and Bronze Refrigerator Locks and Trimmings in the United States, being sole owners of the most valuable patents in existence on this class of goods.

TO say nothing of the line of Iron Toys and Iron, Brass and Bronze Novelties that we also produce in great variety. All our goods are made with the greatest care and of the best material obtainable.



“Renaissance” No. 4047.

If you are in the market for High Grade Goods at extremely moderate prices, and will write us, we shall be glad to give you full particulars.

—o THE o—

**Kenton Hardware M'f'g Co.,**  
Kenton, Ohio, U. S. A.

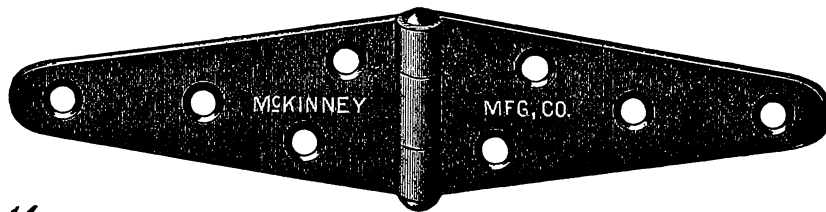


# STEEL HINGES AND BUTTS.

STANDARD GOODS.

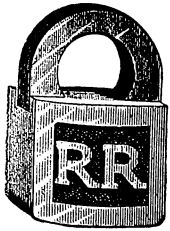
McKINNEY MFG. CO., - ALLEGHENY, PENN.

SEND FOR  
LIST.

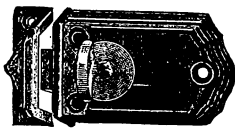


ORDERS FILLED  
ON SIGHT.

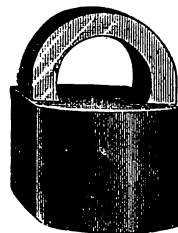
**"NONE BETTER."**



No. 406.



No. 156.



No. 505.

Our goods are the most desirable in every respect. Send for catalogue and prices of our large and complete line.

UNION LOCK & HARDWARE CO., Ltd.,  
LANCASTER, PA.

## SASH WEIGHTS!

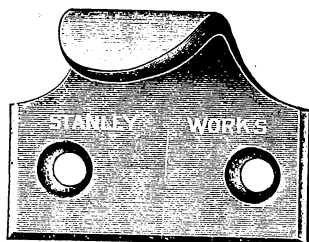
NORTON BROTHERS,

Manufacturers,

Office: 813 Masonic Temple, CHICAGO.

WORKS AT MAYWOOD, ILL.

## WROUGHT STEEL SASH LIFTS.



No. 485. Actual Size.

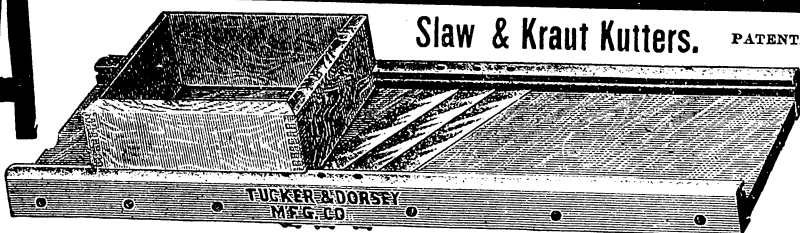
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The Stanley Works, New Britain, Conn.  
79 Chambers St., N. Y.

MAKERS OF STEEL BUTTS, HINGES, ETC.

## ADJUSTABLE ✦ KNIFE

Slaw & Kraut Cutters. PATENTED.



A line that leads them all. Get our new prices.  
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

## Ideal Sash Pulley

No. 60-65.

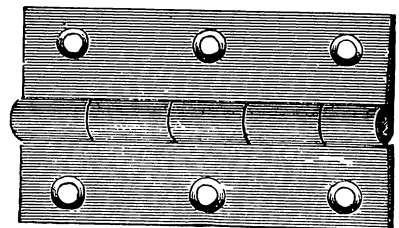
AUGER MORTISE—FACE PLATE.

Made with two inch wheel, plain and polished, cone axle bearings, noiseless and easy running; markers on the side to lay off the centers to bore the holes by.

The best and most uniformly made low-priced Sash pulley on the market.

Sample Free.

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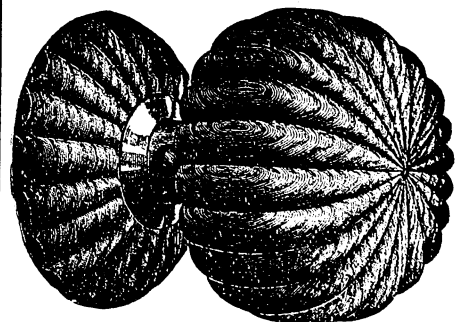
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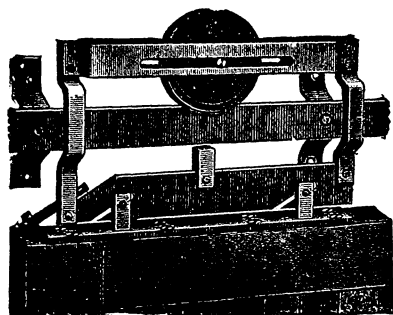
BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.



WOOD DOOR KNOBS,  
DOOR SPRINGS AND CHECKS  
AND CHECKING SPRING HINGES.  
NEW GOODS. NEW PRICES.

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## LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.  
The Wheel is also Steel, except the filling or tread.  
The Track is of Steel—a single one only.  
The Hanger is Anti-Friction.  
More nearly Noiseless than any other.  
Ease of adjustment.

Can be erected with half the labor others require.  
Track will not swell, shrink or warp out of true.  
No cutting of doors.  
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Simplicity in all its parts.  
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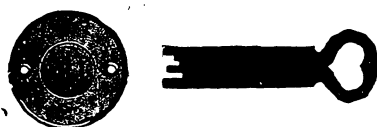
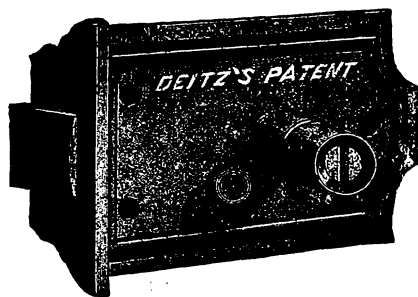
ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

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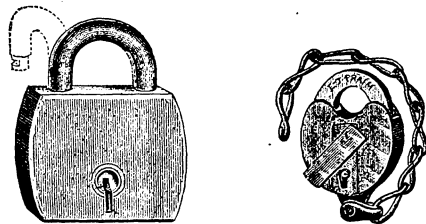
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Factory, **BROOKLYN, E. D., N. Y.**

## SASH WEIGHTS

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PHILADELPHIA, PA.

ESTABLISHED 1879.  
**KEYSTONE LOCK WORKS**  
E. T. FRAIM, Lancaster, Pa., U. S. A.



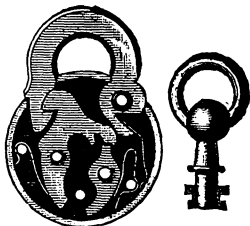
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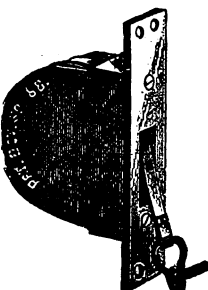


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Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{4}$  and  $\frac{1}{2}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

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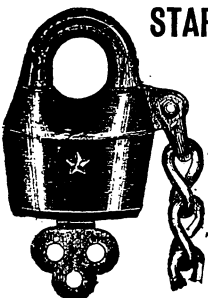
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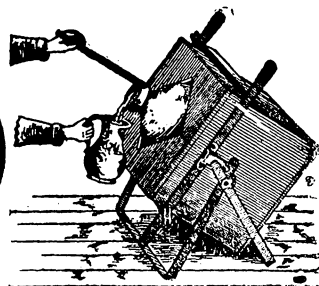
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WHEN THE STEEL AND IRON

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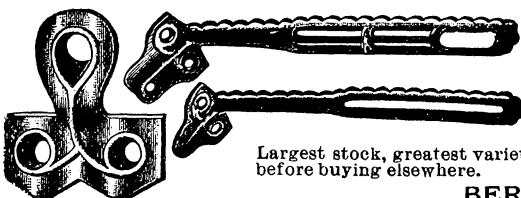
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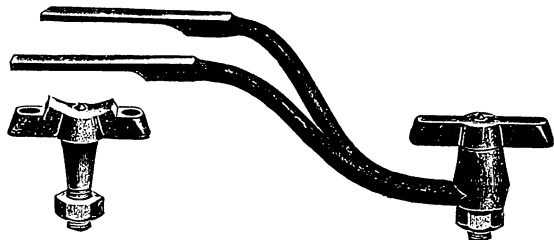


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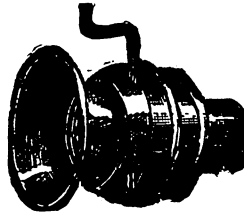
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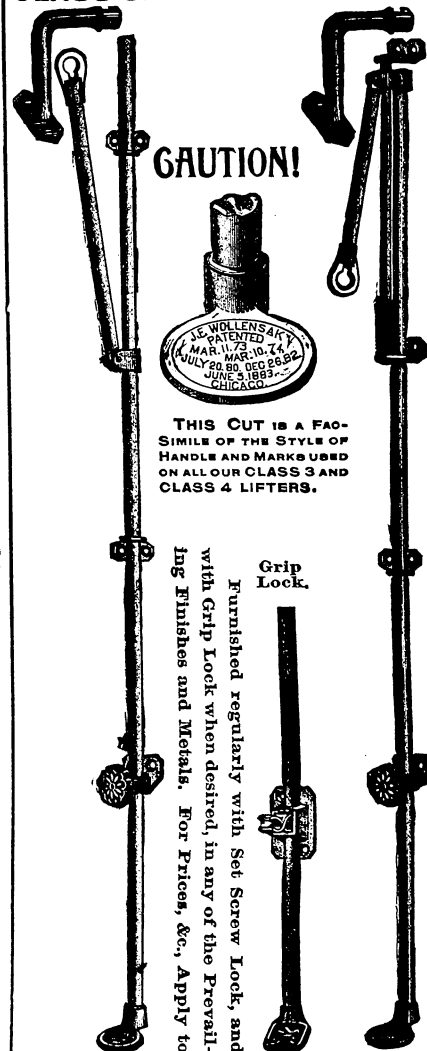
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OLD RELIABLE

J. F. WOLLENSAK'S PATENT.

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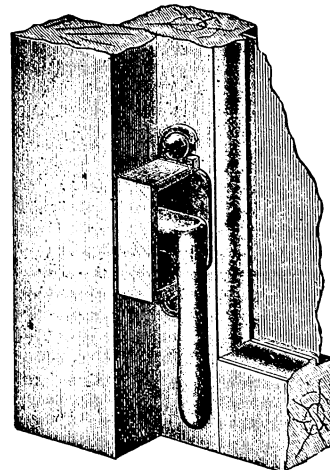
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Grip  
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 Furnished regularly with Set Screw Lock, and  
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The above shows Fastener as applied to the side of  
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Saves Time, Labor and Expense.

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After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



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We would also call your attention to our improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities, use sand or borax in welding on the Calk and cool off at a dark, or still better, cool off without plunging in water.

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Packed in 25 lbs.

Soft Steel Horse  
Shoe Bar, all sizes.

## No. 2 EXTRA SWAGED FRONT.

The advantages of these shoes are that, being made of vastly superior material, they will never show signs of red-shortness or cold shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

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" 2, 14 " " " "	" 4, 8 " " " "

And other sizes in proportion.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

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JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH, PA.

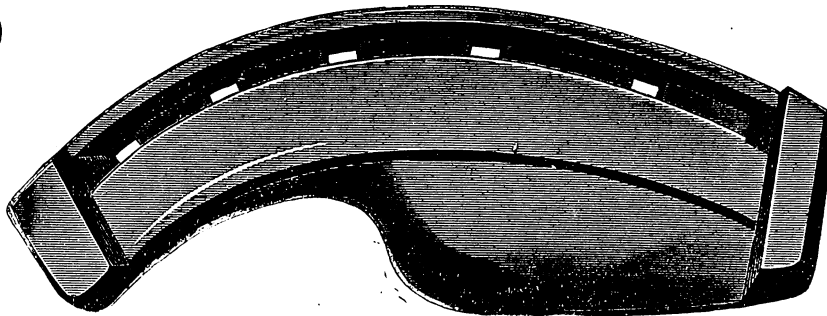


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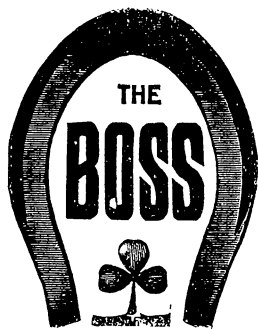
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OX  
SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



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Superior Quality, Shape and Finish.

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Elegant Iron.

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Light, Medium and Heavy.

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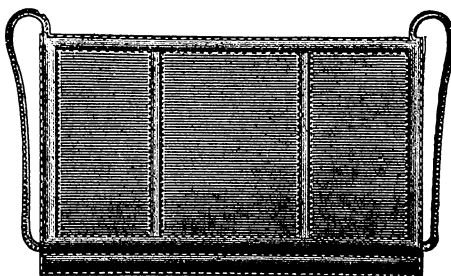
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Dashes,  
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Made from best quality of Scrap Iron  
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CENTENNIAL EXPOSITION  
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HOT-FORGED AND HAMMER-POINTED

**HORSESHOE NAILS.**



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Yours respectfully,

EDWARD SCOTT,

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MANUFACTURERS OF THE BEST QUALITY

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Of Best Material and Workmanship.

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Manufactured by the NATIONAL HORSE NAIL CO.,  
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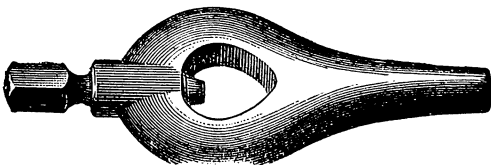
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## LE COUNT'S STRAIGHT TAIL DOG,

WITH STEEL SCREWS.

U. S. Standard, and the points hardened. To be driven from a stud in the face plate.  
It is from the same pattern as the Heavy Steel Dog, and warranted, like that, not to break with any work.



No.	Inch.	Price.	No.	Inch.	Price.
1.....	3/4.....	\$0 60	11.....	2 1/2.....	\$1 45
2.....	7/8.....	70	12.....	3.....	1 60
3.....	1.....	70	13.....	3 1/2.....	1 80
4.....	1 1/4.....	80	14.....	4.....	2 10
5.....	1 1/2.....	80	15.....	4 1/2.....	2 75
6.....	1 3/4.....	95	16.....	5.....	3 25
7.....	1 7/8.....	95	17.....	5 1/2.....	4 00
8.....	1 3/4.....	1 10	18.....	6.....	5 00
9.....	2.....	1 20	19.....	7.....	6 00
10.....	2 1/4.....	1 35	20.....	8.....	7 00

One set to 2 inch, \$7.80. Full set, \$44.10

This pattern will stand much more than a bent tail, and some prefer them on account of their direct action on the work.

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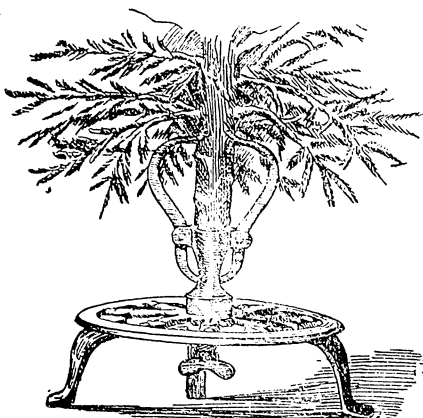
PATENTED SEPT. 1st, 1891.

BUY THE BEST.

*Christmas comes but once a year*

If you want to make your home pleasant and cheerful during the holidays BUY A MERK CHRISTMAS TREE HOLDER. Made of iron, neatly finished in gold bronze or japanned, a great improvement over any heretofore made. By an ingenious contrivance the tree is held secure by strong arms which extend upward from the main body of the receptacle in which it is placed. If desired the tree can be revolved. Sample tree holders sent by express prepaid upon receipt of \$1. Packed in quarter and half dozen crates for shipment. Manufactured and sold only by the ALLENTOWN HARDWARE WORKS, ALLENTOWN, PA.

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Successor to  
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**PATENT STEEL**  
(Blunt and Sharp)  
**TOE-CALKS.**  
—ALSO—  
**BURKE'S IMPROVED**  
**HORSESHOERS'**  
**FOOT VICE.**  
Send for Circulars.  
360 Dorchester Av. Die for Welding  
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## Crescent Horse and Mule Shoes, BAR IRON.

**CRESCENT HORSE SHOE  
IRON CO.**

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Of every description. Also Special Forgings.

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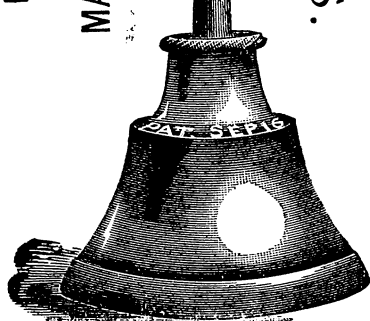
The Iron Age Standard Hardware Lists For Use in Price Books. Compiled by R. R. WILLIAMS, Hardware Editor of *The Iron Age*. These lists are supplied in pamphlet form and are intended to be cut out and inserted in *The Iron Age* Hardware Price Books. For this purpose they are printed on thin and tough paper of the best quality, and prepared with a special view to compactness and convenience of reference. Some of the lists are printed in more than one arrangement, permitting a choice of the best adapted.

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MALLEABLE IRON.

New Improved  
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**Hammer's** Adjustable Clamps.  
Mall. Iron Hand Lamps.  
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New Pattern Heavy Screw Clamps.  
*Strongest in the market.*

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of superior quality, and Hardware Specialties  
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FOR ANTHRACITE AND  
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SEAMLESS  
BRASS  
COLLAR  
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No Solder

6 DIFFERENT  
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SAMPLE 15¢.

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to their customers as a reliable substitute for  
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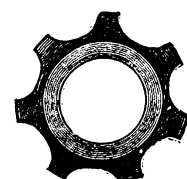
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**"THOMAS MORTON,"**

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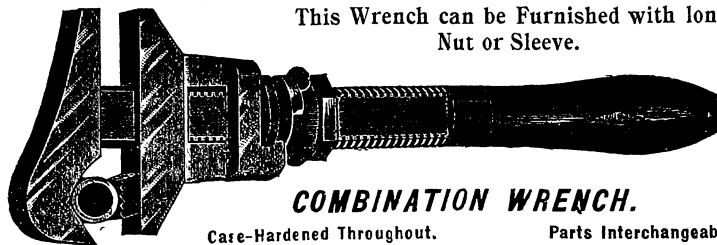
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DROP FORGINGS**  
Made to Order.  
The Wilcox & Howe Co.,  
Manufacturers of a com-  
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BIRMINGHAM, Conn.



This Wrench can be furnished with long  
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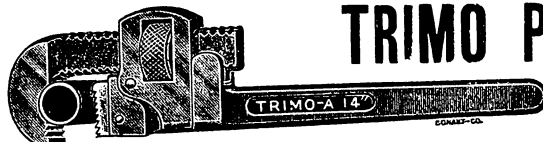
### COMBINATION WRENCH.

Care-Hardened Throughout.

Parts Interchangeable

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the  
requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.  
For Circulars and Price-List, address

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Forged Steel.

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Grips firmly without loss of motion. Releases readily. Never locks. Causes no  
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The chain holds securely;  
cannot fall out even if used  
upside down. Readily releases  
when desired. Solid forged  
head. Fine quality of tool steel.  
Interchangeable gripping jaws.



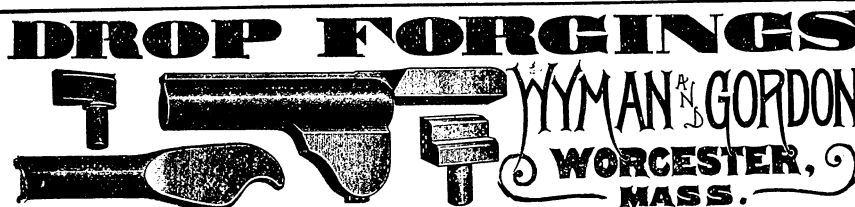
### TRIMO GIANT WRENCH.

Strongest and safest Pipe Wrench ever  
made. No slipping; no locking; no lost motion.

## TRIMO COMBINATION WRENCH FOR NUTS

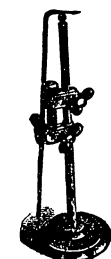
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**TRIMONT MFG. CO. Roxbury, Mass.**



**WYMAN & GORDON  
WORCESTER,  
MASS.**

## Billings' Patent Surface Gauge.



*This Surface Gauge is drop forged, of bar steel,  
and finished in a thorough  
manner, and hardened.*

Send for Illustrated Catalogue and  
Price List of Machinists' Tools . .

**THE BILLINGS & SPENCER CO.,**

HARTFORD, CONN., U. S. A.

London House: Chas. Churchill & Co., 21 Cross St., Finsbury.

## "OHIO" LEVER CUTTER

1894 PATTERN. PRICE \$5.00.

Simple, Durable,

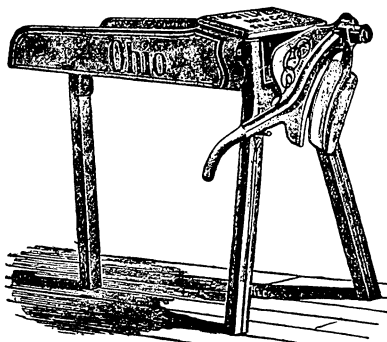
Handsome and Cheap.

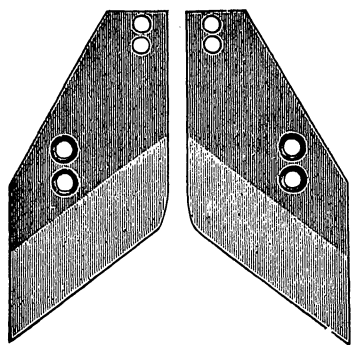
It has an eleven-inch Oil-Tempered Sickle Knife  
which can be adjusted to take up all wear, thus  
giving a perfect shear cut at all times.

Shipped K. D. to secure lowest freight rate, and  
can be set up in a moment.

Send for Catalogue and Quotations on our Com-  
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**THE SILVER MFG. CO., Salem, Ohio.**



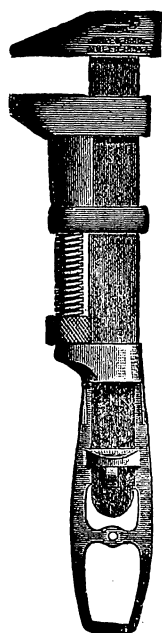
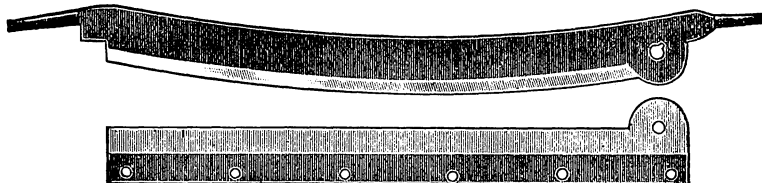
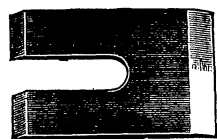


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## Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.



## L. COES'

Genuine Improved  
KNIFE HANDLE  
PATENT

## Screw Wrenches

MANUFACTURED BY  
COES WRENCH CO.,  
WORCESTER, MASS.

Established in  
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Registered  
March 31, 1874.

Patented July  
6, 1880.

Patented July  
8, 1884.

Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

✓ Straight Bar, Extra Long Nut for Screw in Jaw. ✓

The BEST MADE and STRONGEST WRENCH in the MARKET.

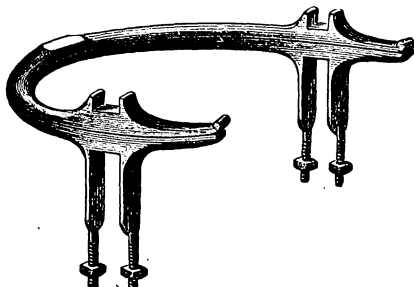
J. C. McCARTY & CO., } New York Agents.  
JOHN H. GRAHAM & CO., }

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KINGS COUNTY IRON FOUNDRY,

Office and Works, Nos. 86, 88, 90, 92 North 12th St.,  
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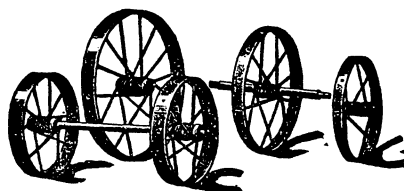
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Drop Forgings of every kind from Iron or Steel.

Send for New Catalogue of Carriage Forgings.

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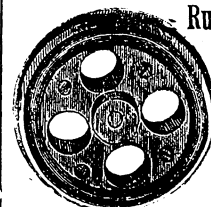


The best there is made for Wheelbarrows and Trucks. Send for Circular and Prices.

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Casters for Trucks,  
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Catalogues free.  
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MADE BY

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No wounds.  
No fretting.

Put Weaners on Calves and turn them out with the cows.  
"It is the only machine I ever had that worked perfectly in every way."  
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Will Shell a Bushel  
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in 4 Minutes.

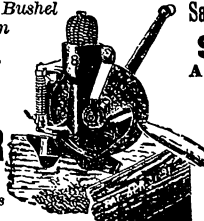
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BEST  
SHELLER  
in the world.

All Machines  
Warranted.



Ask your  
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for it  
Send for  
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— MAKERS OF —

Forks, Hoes, Garden Rakes, Potato Hooks, Scythe Snaths,  
Grain Cradles, Handles, Wheelbarrows, &c.

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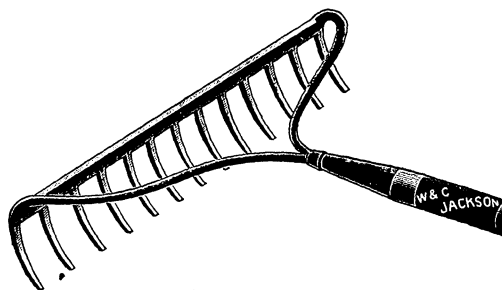
ACME MANURE.



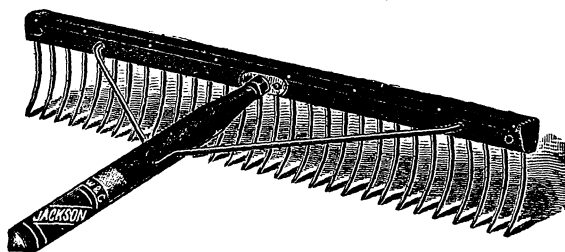
WARREN.



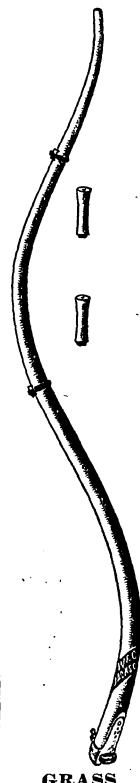
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JACKSON LAWN RAKE.



GRASS SNATH.

# THE IOWA FARMING TOOL CO.

Shops have run continuously for forty years.

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ALL KINDS.

Solid Steel. From 2 to 16 Tines and from 8 to 22 inches long.

SOLID SOCKET AND SHANK

ALL KINDS.

Blades 4 to 12 inches wide.

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Round-Square, 2, 3, 4, 5 and 6 Point.

Steel and Mall. Iron.

## HOES

SOCKET AND SHANK.  
6 to 16 Teeth.  
Single or Braced Shank  
Solid Steel.

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POTATO, MANURE and CLAM.

4, 5 and 6 Tine.

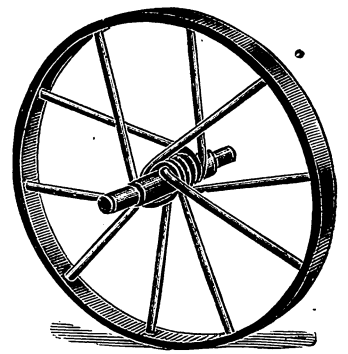
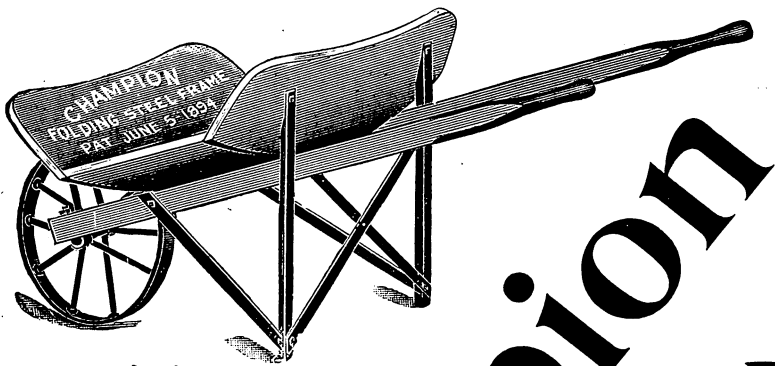
Solid Steel.

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Scythe Snaths and Grain Cradles.

# FORT MADISON, - IOWA, U. S. A.

Illustrated Catalogue on Application.

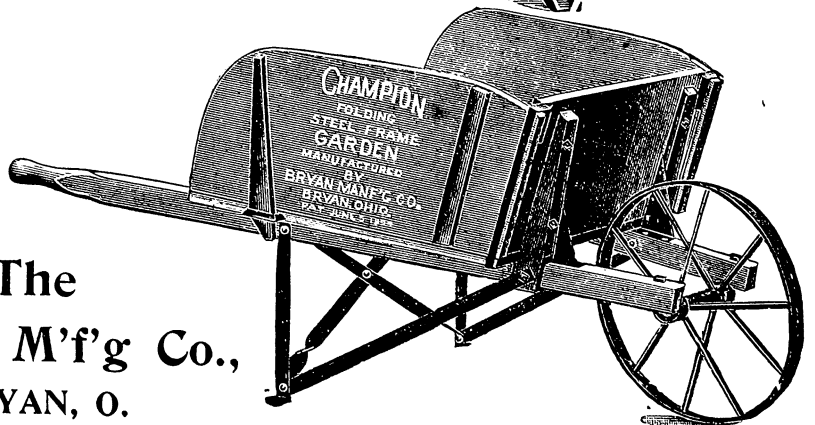
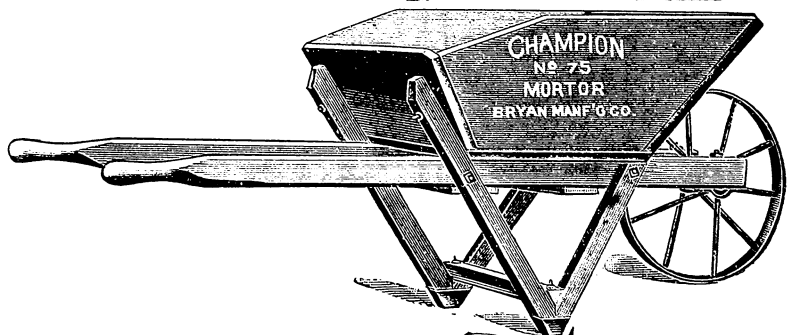
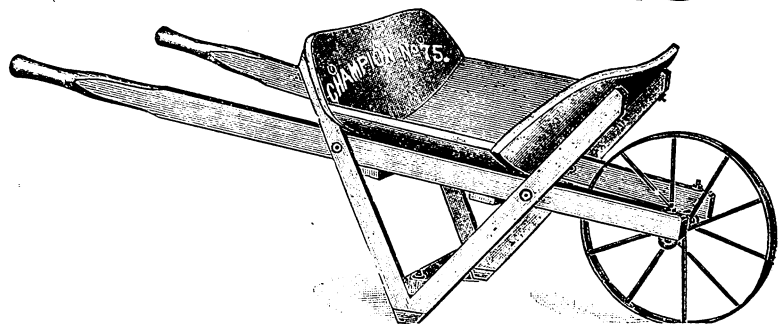
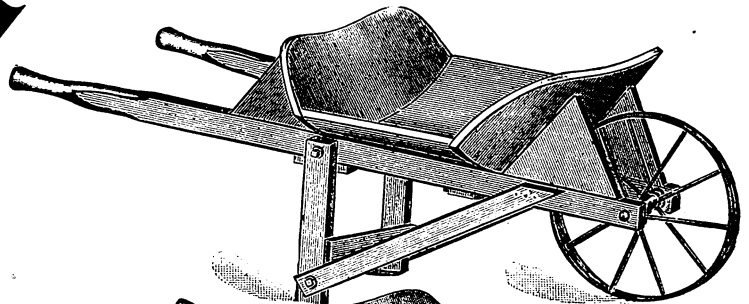


The

Barrows

# Champion

Are  
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Original  
Bolted  
Barrows.

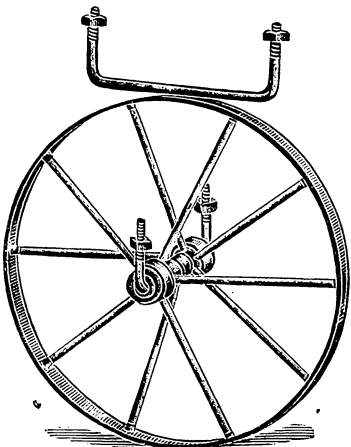


**T**HEY were first in the field and have always maintained that high quality of material and workmanship which has made them so justly popular.

They are the leading barrows to-day and we have added to our line the Folding Steel Frame and Steel Trays, which places us far in advance of any other manufacturer of Wheelbarrows.

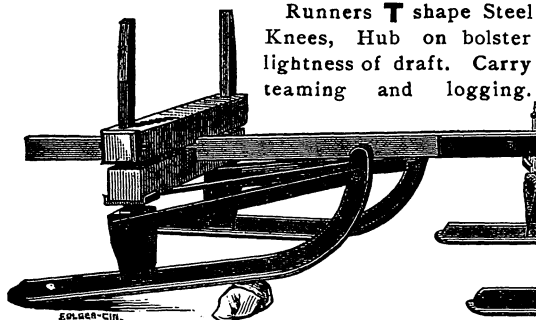
If you send us your orders you will receive the latest and best goods made, at prices that will enable you to sell again and make a handsome profit.

NOTICE THE CONSTRUCTION  
OF OUR WHEELS.



The  
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## HASLUP'S OSCILLATING STEEL BOB SLED AND RUNNERS.



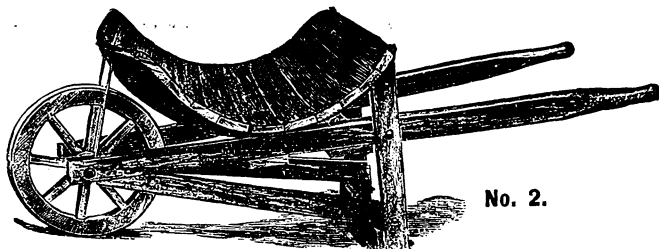
Runners T shape Steel Knees, Hub on bolster lightness of draft. Carry teaming and logging.

Rail, Bearing and Upright Rib one piece, complete with Steel malleable iron. Lightness, Strength and Durability combined with from 8 to 10 tons. Won't break or snap. The boss for farm use Cheap! Send for Circular and Prices. Remember also that we make

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**Sidney Steel Scraper Co.,**

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No. 2.

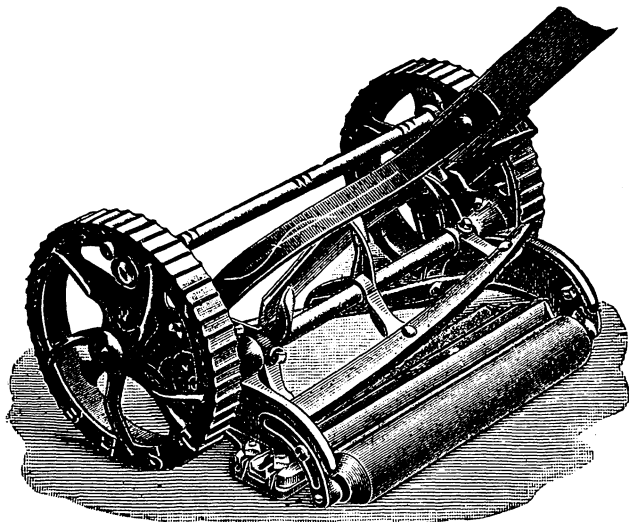
## TROJAN No. 2.

The "Trojan" No. 2 is an all bolted barrow; has sawed staves bent so as to make a perfect fit. Well seasoned and will not split in wet or dry climate. Furnished either with wood or iron wheel.

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## A Lawn Mower for \$1.00.



If you're a jobber or dealer you know how near this is to quotations named you within the last 60 days; but have you considered what such a price would imply?

We can make Lawn Mowers as cheap as anyone but will not put out a machine for \$1.00 nor anything like that. Why? Because it couldn't live. It would fall to pieces in handling, let alone use.

If you will pay a fair price (not a high price, if you please) for a high grade mower let us quote you on our "**BEST.**" Remember the name.

**F. S. Anderson Co., Richmond, Ind.**

## McGuire's ♦ Diamond.

MANUFACTURED BY

**Dille & McGuire Mfg. Co.,**  
**RICHMOND, IND., U. S. A.**

### PRICE-LIST.

Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

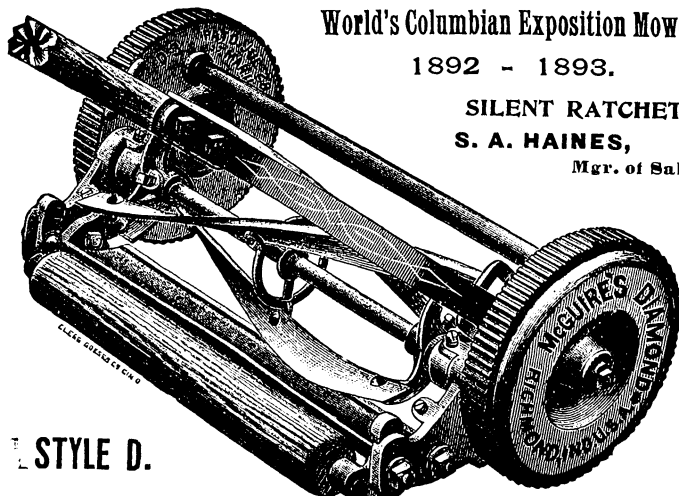
LENGTH.	LIST.	Discount to the
10, Inch	\$13.00	Trade,
12 "	14.00	70 per cent.
14 "	15.00	F. O. B. Factory.
16 "	16.00	
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PHOSPHOR BRONZE JOURNAL BEARINGS. BEST QUALITY STEEL.

This is the Mower contracted for by the Chief of Construction at the Columbian Exposition; was used on the lawns at the World's Fair grounds during the preparatory season of 1892, and being approved by the Landscape Architects, was adopted exclusively for 1893.

If you wish a first-class mower in all respects, one that is fully warranted,

**— BUY MCGUIRE'S DIAMOND. —**



— OFFICIAL —

World's Columbian Exposition Mower,  
1892 - 1893.

SILENT RATCHET.

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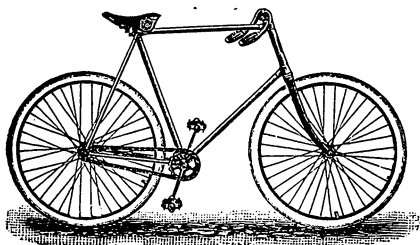
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Have you an agency for a **FIRST CLASS** Bicycle?

If not, you want to write us and see about obtaining control of the justly celebrated



## Syracuse Bicycle,

For which we are sole distributing agents for Pennsylvania, New Jersey and Delaware.

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WE WANT AN AGENT IN EVERY CITY, TOWN AND HAMLET.

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WATCH THIS SPACE EVERY WEEK.

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CIRCULAR  
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Lawn Mowers,  
" Settees,  
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" Sprinklers,  
" Etc., Etc.

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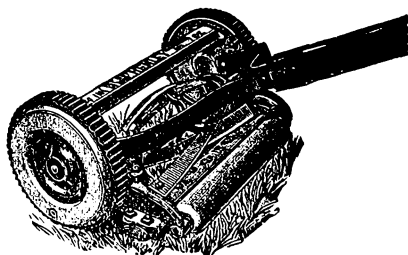
Coldwell Lawn Mower Co.,  
NEWBURGH,  
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THESE LAWN MOWERS ARE AS GOOD AS MONEY CAN BUY.

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For Lawns and Parks

Are first class, high grade machines, made of the best materials, neat, symmetrical, strong and unexcelled in construction and ease of operation. Does perfect work. For prices, address



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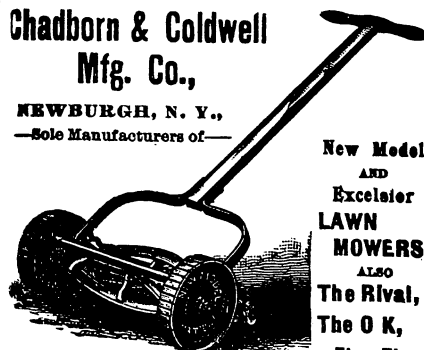
If you are ready to place your order for Lawn Sprinklers, Couplings, Hose Pipe, Spray Nozzles, etc.,

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**WE HAVE the LARGEST LINE.**

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—Sole Manufacturers of—



New Model  
AND  
Excelster  
LAWN  
MOWERS  
ALSO  
The Rival,  
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Lay in your stock of

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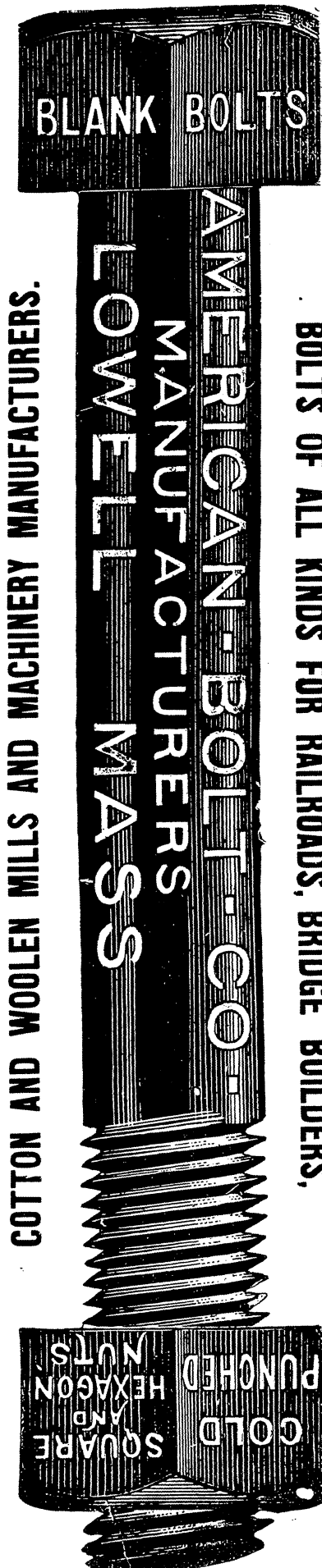
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Line for 1895.

List Now Ready. Send for it.  
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COTTON AND WOOLEN MILLS AND MACHINERY MANUFACTURERS.

BOLTS OF ALL KINDS FOR RAILROADS, BRIDGE BUILDERS.

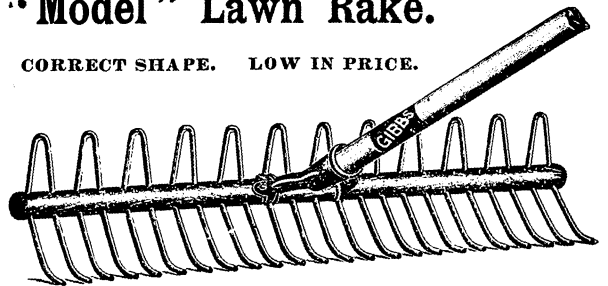
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## Write for Prices "Model" Lawn Rake.

ON OUR LINE OF

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CORRECT SHAPE. LOW IN PRICE.



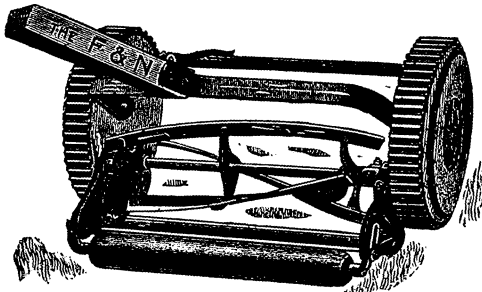
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Lawn Mowers and Grass Catchers,  
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"The F. & N. Lawn Mower '95,"  
The Standard American Mower.

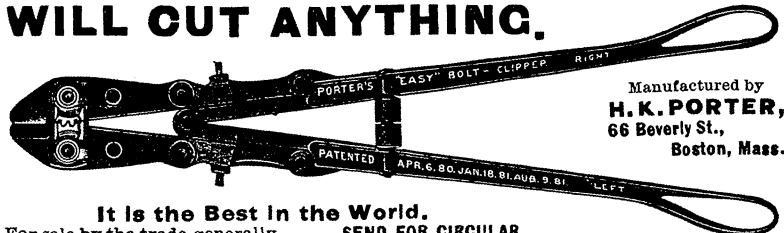
All Machines fitted with

Solid Tool Steel Cutter Bar,  
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Best Material, Highest Class Workman-  
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Manufactured by  
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It is the Best in the World.  
For sale by the trade generally. SEND FOR CIRCULAR.

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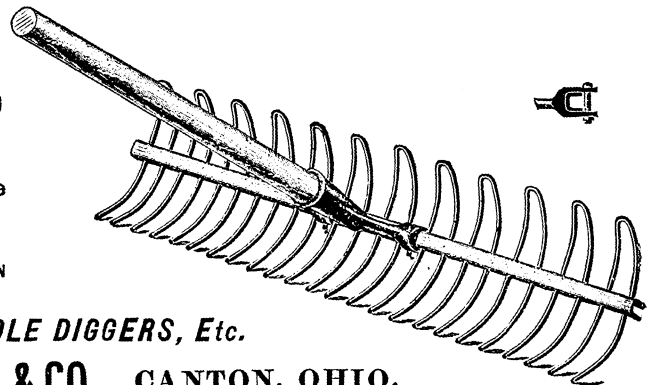
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The Best Rake  
in the World.

WRITE FOR DESCRIPTION  
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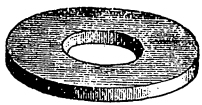


Send for 1894  
Catalogue and Prices.



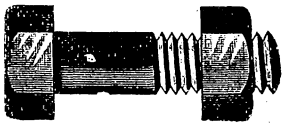
Hardware Specialties.  
OAKES & IRWIN,  
DECATUR, ILL.





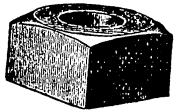
# WROUGHT WASHERS.

Every Washer  
**FLAT**  
With hole in  
**TRUE CENTER.**



## MACHINE BOLTS.

Highest



## HOT PRESSED NUTS.

Standard of  
**EXCELLENCE.**

**THE MILTON MNFG. CO., - Milton, Pa.**

**Pennsylvania Bolt & Nut Co.**  
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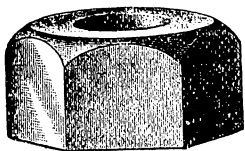
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## Port Chester Bolt & Nut Co.,

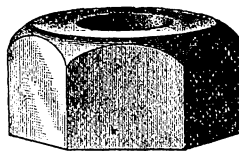
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MANUFACTURERS OF

Cold Punched, Chamfered and Trimmed, Case-Hardened  
and Semi-Finished



## NUTS.



NUTS FOR RAILROADS, CAR BUILDERS', LOCOMOTIVE BUILDERS' AND MACHINISTS'  
USE A SPECIALTY.

CORRESPONDENCE SOLICITED.

ESTABLISHED 1865.

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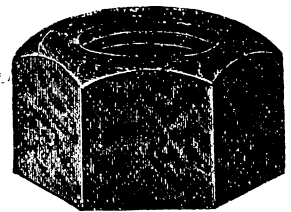
**Bolts, Nuts, Washers, Rivets.**

Send for our New Catalogue and Discounts.

## DUNHAM NUT CO., UNIONVILLE, CONN.,

Manufacturers of

All Grades  
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Finished  
Nuts  
and



Automatic Cold Press Nut Machines.

SEND FOR CATALOGUE.

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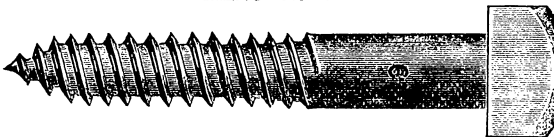
Manufacturers of Single and Double,  
For fastening all kinds of Structure to Brick and Stone  
Work. Catalogue furnished on application.  
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**SCREWS**  
Machine Screws for electrical purposes. Sample box free. Send for circular.  
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WM. H. HASKELL, PRESIDENT.

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 —MANUFACTURERS OF—  
**GIMLET POINT COACH SCREWS**  **Bolts, Cold-Punched Nuts and Washers,**  
 SUITABLE FOR MACHINERY OF ALL KINDS.

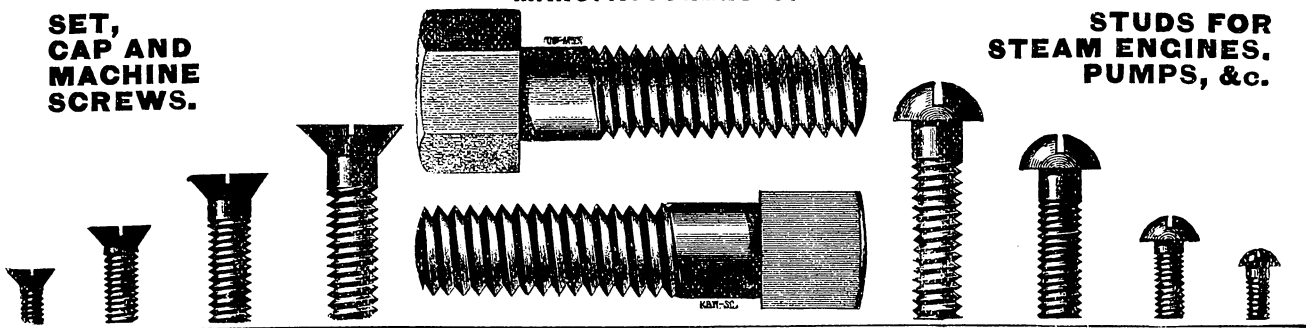
Office and Works: 451 Main St., PAWTUCKET, R. I., U. S. A.  
**HENRY B. NEWHALL CO., Agents,**  
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**WORCESTER MACHINE SCREW CO., Worcester, Mass.**

MANUFACTURERS OF

**SET,  
CAP AND  
MACHINE  
SCREWS.**

**STUDS FOR  
STEAM ENGINES,  
PUMPS, &c.**

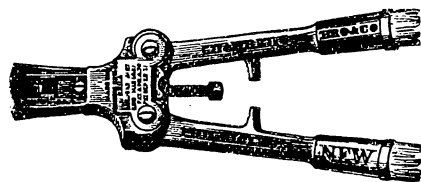


**EXPANSION BOLTS.**



For Fastening all Kinds of Structure to Brick and Stone Work.

Patentee and Mfr. **ISAAC CHURCH,**  
 Send for Catalogue. 1521 Walnut St., TOLEDO, O



**BOLT & RIVET CLIPPERS,**

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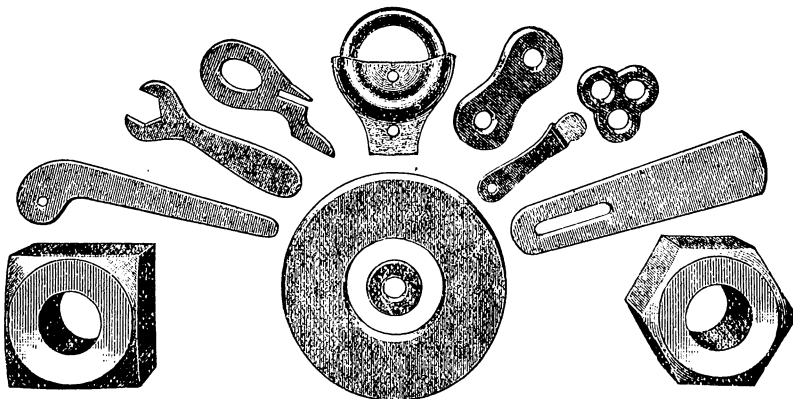
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Wrightsville Hdw. Co., Wrightsville, Pa.

**Gear Cutters.**  
D. E. Whiton Mach. Co., New London, Conn.

**Gears.**  
Boston Gear Works, Boston, Mass.  
Lincoln Iron Works, Rutland, Vt.  
Poole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.

**Glass Boards.**  
Canton Saw Co., Canton, O.  
Lufkin Rule Co., Saginaw, Mich.

**Glass Cutters.**  
Monce, S. G., Bristol, Conn.

**Glaziers' Points.**  
Shelton Co., Birmingham, Conn.

**Glue.**  
Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russia Cement Co., Gloucester, Mass.

**Grinding Mills.**  
Foos Mfg. Co., Springfield, O.

**Grinding and Polishing Machines.**  
Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
Herriek & Cowell, New Haven, Conn.  
Norton Emery Wheel Co., Worcester, Mass.

**Grindstone Dressing Machinery.**  
Blake & Johnson, Waterbury, Conn.

**Grindstones.**  
Cleveland Stone Co., Cleveland, O.  
Grafton Stone Co., Grafton, Ohio.

**Gun Implements.**  
Bridgeport Gun Implement Co., 315-35 Broadway, N. Y.  
Union Hdw. Co., Torrington, Conn.

**Gunpowder, Makers of.**  
Lafin & Rand Powder Co., 29 Murray St., N. Y.

**Gymnasium Supplies.**  
Independent Electric Co., Chicago, Ill.

**Handles.**  
Cleveland Wood Turning Co., Cleveland, O.  
Piqua Handle & Mfg. Co., Piqua, Ohio.

**Hangers, Door.**  
Chicago Spring Butt Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Lane Bros., Poughkeepsie, N. Y.

**Hardware Comm'n Merchants.**  
Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Drawers.**  
Wernicke Co., Minneapolis, Minn.

**Hardware Jobbers.**  
White, Van Ghalen & Co., 15-17 Chatham Square, N. Y.

**Hardware Manufacturers.**  
Allentown Hardware Works, Allentown, Pa.  
Covert Mfg. Co., West Troy, N. Y.  
Miller Falls Co., 93 Read St., N. Y.  
Parker, Chas. Co., Meriden, Conn.  
Russell & Erwin Mfg. Co., Chambers St., New York.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. R. & Co., Groton, N. Y.  
Supplee Hdw. Co., Phila., Pa.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Hardware Mrs. Agents.**  
Bingham, W. C., Cleveland, O.  
Graham, John H. & Co., 113 Chambers.  
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

**Hardware Specialties.**  
Acme Shear Co., Bridgeport, Conn.  
Burger Bros., Philadelphia, Pa.  
Clark Mfg. Co., Buffalo, N. Y.  
Caterpillar Mfg. Co., Philadelphia, Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gwiner Mfg. Co., Hamilton, O.  
Johnson, S. C., Racine, Wis.  
North Bros. Mfg. Co., Philadelphia, Pa.  
Scranton & Co., New Haven, Conn.  
Union Lock & Hdw. Co., Lancaster, Pa.  
Wrightsville Hdw. Co., Wrightsville, Pa.

**Harpes Snaps.**  
Covert Mfg. Co., West Troy, N. Y.  
Coverts' Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.

**Hay Tools.**  
Myers, F. E. & Bro., Ashland, O.

**Hoes.**  
Withington & Cooley Mfg. Co., Jackson, Mich.

**Hog Rings and Ringers.**  
Oakes & Irwin, Decatur, Ill.

**Hoisting Machines.**  
Box, Alfred & Co., 314 Green, Phila.  
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.  
Byers, Jno. F. Mch. Co., Ravenna, O.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E. Son & Co., Phila.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
McCoy, Jos. F. & Co., 26 Warren St.  
Maris & Beckley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Spindel, J. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**  
Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.

**Horse Clippers.**  
Gillette Clipping Machine Co., 201 E. 23d St., N. Y.

**Horse Nails, Makers of.**  
Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes, Makers of.**  
Bryden Horse Shoe Co., Catsaugua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Leonard, J., 146 West St., N. Y.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.

**Hose.**  
Cleveland Rubber Works, Cleveland, O.  
N. Y. Belding & Packing Co., Ltd., 16 Park Row, N. Y.

**Hose Coupler.**  
Adams & Westlake Co., Chicago, Ill.

**Hydrants, &c.**  
McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Forging.**  
U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.**  
Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.

**Hydraulic Machinery.**  
Wood, Wm. H., Media, Pa.

**Ice Cream Freezers.**  
Clement & Dunbar, Phila., Pa.  
White Mountain Freezer Co., Nashua, N. H.

**Ice Creepers.**  
Waller, Geo. A., Syracuse, N. Y.

**Injectors.**  
Brynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.  
Sherwood Mfg. Co., Buffalo, N. Y.

**Insurance, Boiler.**  
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**  
Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.

**Iron Commission Brokers.**  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lee, J. Tammal & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**  
Samuel, Frank, Philadelphia, Pa.

**Iron Merchants.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Con, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Cunliffe, R. M., Phila., Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 677 to 683 Greenwich St., N. Y.

Pierson & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 68 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.

**Iron, Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet, Manufacturers of.**  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Ltd., McKeesport, Pa.

**Ironwork, Ornamental.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.

**Japanning.**  
Smith, Theo. V., 54 John St., N. Y.

**Keys.**  
Wollensak, J. F., Chicago, Ill.

**Ladies.**  
Whiting Fdy. Equipment Co., Chicago, Ill.

**Lanterns.**  
Buhl Stamping Co., Detroit, Mich.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Laths.**  
Kupferle, Jno. C., St. Louis, Mo.

**Lathes.**  
Beaman & Smith, Providence, R. I.  
Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H. Jr., & Co., Philadelphia, Pa.  
Jones & Lamson Mch. Co., Springfield, Vt.  
New Haven Mfg. Co., New Haven, Conn.  
Rhodes, L. E. Co., Hartford, Conn.  
Sebastian Lathe Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Lathing, Expanded Metal.**  
Chess Bros., Pittsburgh, Pa.

**Lathing, Wire.**  
Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Lawn Mowers.**  
Anderson, F. & Co., Richmond, Ind.  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.  
Stearns, E. C. & Co., Syracuse, N. Y.

**Lawn Rakes.**  
Gibbs Mfg. Co., Canton, Ohio.  
Kohler, F. E. & Co., Canton, O.

**Lawn Sprinklers.**  
Blair Mfg. Co., Springfield, Mass.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
McGowan, John H. Co., Cincinnati, O.

**Letters and Figures, Metallic.**  
White, A. A. & Co., Providence, R. I.

**Letters, Paper.**  
Tablet & Ticket Co., Chicago, Ill.

**Levels.**  
Richardson, C. F. & Son, Athol, Mass.

**Locks and Knobs, Manufacturers of.**  
Dietz, A. E., 97 Chambers, N. Y.  
Kenton Hdw. Mfg. Co., Kenton, Ohio.  
Reading Hdw. Co., Reading, Pa.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Lubricants.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.

**Machinery.**  
Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Beaman & Smith, Providence, R. I.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Dey, N. Y.  
Bignall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Bullard Mch. Tool Co., Bridgeport, Conn.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Light & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Hartford Machine Screw Co., Hartford, Conn.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Johnson, Israel H., Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinery Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Places, Geo., 145 Broadway, N. Y.  
 Pond, L. W. Mch. Co., Worcester, Mass.  
 Poole, Robt. & Son, Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Prentiss Tool & Supply Co., N. Y.  
 Scranton Supply & Mchry. Co., Scranton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seyfert's Sons, L. F., Philadelphia, Pa.  
 Sigourney Tool Co., Hartford, Conn.  
 Steptoe, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Walker Mfg. Co., Cleveland, O.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**  
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**  
 Loring Coes & Co., Worcester, Mass.  
 Loyd, John, 558-562 Water St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**  
 American Iron & Bolt Co., Cincinnati, Ohio.  
 Hubbell, Harvey, Bridgeport, Ct.  
 Rhode Island Tool Co., Providence, R.I.
- Machine Tools.**—See Machinery.
- Machine Work.**  
 Papping, J., 68th St. & 11th Ave., N. Y. City.
- Machinists Scales.**  
 Coffin & Leighton, Syracuse, N. Y.  
 Starrett, L. S. Co., Athol, Mass.
- Machinists' Tools and Supplies.**  
 King, J. M. & Co., Waterford, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**  
 Chicago, Milwaukee & St. Paul R. Co., Chicago, Ill.
- Measuring Tapes.**  
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**  
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**  
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**  
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**  
 Fearling, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**  
 American Metal Co., N. Y.
- Metal Saws.**  
 Q. & C. Co., Chicago, Ill.
- Metallic Ceilings.**  
 Penn. Iron Roofing & Corrugating Co., Phila., Pa.
- Metallurgists.**  
 Britton, J. Blodgett, Phila., Pa.
- Mining Knives.**  
 Palmer Hdw. Mfg. Co., Troy, N. Y.  
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**  
 Darby, Edw. & Sons, Phila., Pa.  
 Leonard, B. B., Scranton, Pa.
- Mining Screens.**  
 Harrington & King Perforating Co., Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**  
 Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**  
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**  
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**  
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Keg Stock.**  
 Crescent Mfg. Co., Detroit, Mich.
- Nail Machinery.**  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**  
 Am. Specialty Co., Hartford, Conn.  
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**  
 Borden & Lovell, 70 West, N. Y.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.  
 Valley Steel Co., St. Louis, Mo.
- Nickel Plated Supplies.**  
 Eddy Electric Mfg. Co., Windsor, Conn.
- Nickel Platers' Supplies.**  
 Hanson & Van Winkle Co., Newark, N.J.  
 Zucker & Levett & Loeb Co., 10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**  
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**  
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**  
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**  
 American Bolt Co., Lowell, Mass.  
 American Iron & Bolt Co., Cincinnati, Ohio.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Rhode Island Tool Co., Providence, R.I.  
 Russell, Burdall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cups and Lubricators.**  
 Sherwood Mfg. Co., Buffalo, N. Y.
- Others.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oilless Anti-Friction Metals.**  
 North American Metalline Co., Long Island City, N. Y.
- Oil Stones.**  
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**  
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**  
 Scranton Forging Co., Scranton, Pa.
- Packing.**  
 Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**  
 Ames Sword Co., Chicopee, Mass.  
 Frahm, E. T., Lancaster, Pa.  
 Union Lock & Hdw. Co., Lancaster, Pa.  
 Wolf, W. & L., Phila., Pa.
- P-ills.**  
 Richmond Cedar Wks., Richmond, Va.
- Paint.**  
 Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**  
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**  
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**  
 Butler, C. N., Phila., Pa.  
 Jenner, E. W. T., Washington, D. C.  
 Howson & Howson, Philadelphia and Washington  
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**  
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**  
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**  
 Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.
- Pig Iron.**  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Mantour Iron & Steel Co., Danville, Pa.  
 Norvick & Co., 45 Wall, N. Y.  
 Pilling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**  
 Am. Pig Iron Storage Warehouse Co., 44 Wall, N. Y.
- Pile Drivers.**  
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**  
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignall & Keeler Mfg. Co., St. Louis, Mo.  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Hancock, Henry B. & Co., Phila.  
 Saunders' Sons, D., Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**  
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**  
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Sewer.**  
 Columbus Sewer Pipe Co., Columbus, Ohio.
- Pipe, Water and Gas, Makers of.**  
 Donaldson Iron Co., Emaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.
- Planers.**  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 New Haven Mfg. Co., New Haven, Conn.  
 Pond, L. W. Mch. Co., Worcester, Mass.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**  
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**  
 Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 Moorhead-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.  
 Singer, Nimick & Co., Pottsville, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**  
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**  
 Gibbs Mfg. Co., Canton, Ohio.  
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**  
 Babrum, E. T., Detroit, Mich.  
 Gibbs & Bennett Mfg. Co., 42 Cliff St., N. Y.  
 N. J. Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."  
 Tyler Wire Works Co., W. S., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**  
 Lathin & Rand Powder Co., 29 Murray.  
 New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**  
 Denlett & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Lingle, Bellefonte, Pa.  
 Miner & Peck Mfg. Co., New Haven, Conn.  
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**  
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeton, N. J.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Marville, E. Mch. Co., Waterbury, Ct.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printing and Embossing.**  
 Griffin, Axtell & Cady Co., Holyoke, Mass.
- Pruners.**  
 Henry, J. T. Mfg. Co., Hamden, Conn.
- Pruning Shears.**  
 Clyde Cutlery Co., Clyde, O.
- Pulleys.**  
 Brown, A. & F., 17 Day St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Reading Wood Pulley Co., Reading, Pa.  
 Reeves Pulley Co., Columbus, Ind.
- Pumping Machinery.**  
 Dean Bros. Steam Pump Works, Indianapolis, Ind.  
 Gould Mfg. Co., Seneca Falls, N. Y.  
 Hooker-Corliss Steam Pump Co., St. Louis, Mo.  
 Lucas, C. O. & Co., Greenville, Ohio.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk, Conn.  
 Southwick Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Works, Easthampton, Mass.  
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pump Leathers.**  
 Detroit Valve & Washer Co., Detroit, Mich.
- Pumps, Makers of.**  
 Deming Co., Salem, O.  
 Derrig, W. & B., Middletown, Conn.  
 Goulds Mfg. Co., Seneca Falls, N. Y.  
 Myers, F. E. & Bro., Ashland, O.  
 Peters Pump Co., Kewanee, Ill.
- Punches.**  
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**  
 Bertsch & Co., Cambridge City, Ind.  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Butts & Ordway, Boston, Mass.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeton, N. J.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Wais & Roos Punch & Shear Co., Cincinnati, Ohio.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**  
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**  
 Burditt & Williams, Boston, Mass.  
 Estey, W. S., 65 Fulton, N. Y.  
 Excelsior Cutlery Co., Worcester, Mass.
- Razor, Manufacturers of.**  
 Millbury Razor Co., Millbury, Mass.  
 Swedish Razor Co., Worcester, Mass.
- Reducing Valves.**  
 D'Este & Seelye Co., Boston, Mass.
- Reels.**  
 Hendryx, A. B. Co., New Haven, Conn.
- Reference Book.**  
 Thomas Publishing Co., Phila., Pa.
- Refrigerators.**  
 Wisconsin Refrigerator Co., Eau Claire, Wis.
- Rivers.**  
 Blake & Johnson, Waterbury, Conn.  
 Burden Iron Co., Troy, N. Y.  
 Cobb & Drew, Plymouth, Mass.  
 Dover Iron Co. of N. J., Dover, N. J.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**  
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**  
 Birmingham Iron F'dry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 Leechburg Foundry & Mch. Co., Pittsburgh, Pa.  
 Morgan Construction Co., Worcester, Mass.  
 Robinson-Rea Mfg. Co., Pittsburgh.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.  
 Trethewey Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**  
 Birmingham Iron Foundry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 East Chicago F'dry Co., Chicago, Ill.  
 Garrison, A. F'dry Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
- Roofing.**  
 Berlin Iron Bridge Co., E. Berlin, Conn.  
 Cincinnati Corrugating Co., Fiqua, O.  
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**  
 Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**  
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**  
 Stanley Rule & Level Co., 29 Chambers.  
 Stephens & Co., Riverton, Conn.
- Sad Irons.**  
 Enterprise Mfg. Co., Phila., Pa.  
 Streeter, N. R. & Co., Groton, N. Y.
- Sample Holder.**  
 Massey & Thompson, Monroe City, Mo.
- Sand Paper.**  
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**  
 Caldwell Mfg. Co., Rochester, N. Y.  
 Pullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**  
 Morton, Thos., 65 Elizabeth, N. Y.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Fasteners.**  
 Wooster, F. V., Boston, Mass.
- Sash Lifts.**  
 Stanley Works, New Britain, Conn.
- Sash Locks.**  
 Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**  
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**  
 Brown, E. B. & Co., Philadelphia, Pa.  
 Kings County Iron Foundry, Brooklyn, N. Y.  
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**  
 Diston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**  
 Atkins, E. C. & Co., Indianapolis, Ind.  
 Butler Mfg. Co., Boston, Mass.  
 Diston, Henry & Sons, Phila., Pa.  
 National Saw Co., Newark, N. J.  
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**  
 Taintor Mfg. Co., 64-86 Chambers, N. Y.
- Saw Vises.**  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**  
 Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**  
 Buffalo Scale Co., Buffalo, N. Y.  
 Chatillon, John & Sons, 85-89 Cliff, N. Y.  
 Standard Scale & Fixtures Co., St. Louis, Mo.
- Scrapers, Road.**  
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screens, Window and Door.**  
 Huebner Screen Door Co., Detroit, Mich.  
 Phillips, A. J. Co., Fenton, Mich.
- Screw and Bolt Cases.**  
 Smith Bros. Hdw. Co., Columbus, O.
- Screw Cutting Machinery.**  
 Wells Bros. & Co., Greenfield, Mass.  
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**  
 Brown, R. H. & Co., New Haven, Conn.  
 Gay & Parsons, Augusta, Me.  
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Machinery.**  
 Hartford Machine Screw Co., Hartford, Conn.
- Screw Plate and Pipe Cutter.**  
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Wm. H. Haskell Co., Pawtucket, Mass.  
 Miles, F. S., 205 Quarry, Philadelphia.  
 Reynolds & Co., New Haven, Conn.  
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**  
 Bues, W. F. & John, Rockford, Ill.  
 Millers Falls Co., 93 Reade St., N. Y.  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Soythe Stones and Whetstones.**  
 Pike Mfg. Co., Pike Station, N. H.  
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**  
 Brown, A. & F., 17 Day St., N. Y.  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
 Fairmount Mch. Co., Philadelphia, Pa.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 East Chicago F'dry Co., Chicago, Ill.



- Allentown Rolling Mill**, Allentown, Pa.  
**Lockhart Iron & Steel Co.**, Pittsburgh, Pa.  
**Passaic Rolling Mill Co.**, Paterson, N.J.  
**The Phoenix Iron Co.**, Phila., Pa.  
**Pottsville Iron & Steel Co.**, Pottsville, Pa.  
**Roberts, A. & P. & Co.**, Phila., Pa.
- Shears and Scissors.**  
**Acme Shear Co.**, Bridgeport, Conn.  
**Olaus Shear Co.**, Fremont, Ohio.  
**Helmsch, R. Sons Co.**, Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**  
**Atna-Standard Iron and Steel Co.**, Bridgeport, O.  
**Cambridge Iron & Steel Co.**, Cambridge, Ohio.  
**Jersey City Galvanizing Co.**, 112 John St., N. Y.  
**Mahoning Valley Iron Co.**, Livingston, Ohio.  
**Morehead-McCleane Co.**, Pittsburgh.  
**Pierston & Co.**, 29 Broadway, N. Y.  
**Singer, Nimick & Co., Ltd.**, Pittsburgh, Pa.  
**The Mahoning Valley Iron Co.**, Youngstown, O.  
**Alan Wood Co.**, Philadelphia.  
**W. Dewees Wood Co.**, McKeesport, Pa.
- Sheet Zinc.**  
**Mathlessen & Hegeler Zinc Co.**, La Salle, Ill.
- Shelf Brackets.**  
**Adas Mfg. Co.**, New Haven, Conn.
- Shoe Stands.**  
**Kupferle, Jno. C.**, St. Louis, Mo.
- Show Cases.**  
**Union Show Case Co.**, Chicago, Ill.
- Sinks.**  
**Douglas, W. & B.**, Middletown, Conn.
- Skate Grinding Machinery.**  
**Perkins, Chas.**, Bridgewater, Mass.
- Skates, Ice.**  
**Barney & Berry**, Springfield, Mass.  
**Dame, Stoddard & Kendall**, Boston, Mass.  
**Keene Mfg. Co.**, Keene, N. H.  
**Supple Hardware Co.**, Phila., Pa.  
**Winslow, Sam'l.**, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**  
**Henley, M. C.**, Richmond, Ind.  
**Union Hardware Co.**, Torrington, Ct.  
**Winslow, Sam'l.**, Skate Mfg. Co., Worcester, Mass.
- Slaw Cutters.**  
**Tucker & Dorsey Mfg. Co.**, Indianapolis, Ind.
- Smelting Works.**  
**Reeves, Paul S.**, 700 S. Broad, Phila.
- Snow Shovels.**  
**Phillips, A. J. Co.**, Fenton, Mich.
- Soldering Coppers.**  
**Clendenin Bros.**, Baltimore, Md.  
**Covert Mfg. Co.**, West Troy, N. Y.
- Soup Digesters.**  
**Stuart & Peterson Co.**, Phila., Pa.
- Speaking Tubes.**  
**Ostrander, W. R. & Co.**, 204 Fulton St., N. Y.  
**Wollensak, J. F.**, Chicago, Ill.
- Spelter.**  
**Mathlessen & Hegeler Zinc Co.**, La Salle, Ill.
- Spoons and Forks.**  
**Boardman, L. & Son**, New Haddam, Conn.  
**Holmes & Edwards Silver Co.**, Bridgeport, Conn.  
**Rogers, The Wm. Mfg. Co.**, Hartford, Conn.
- Sporting Goods.**  
**Hartley & Graham**, 313-315 B'way, N. Y.
- Spring.**  
**Coiled Wire Belting Co.**, Jersey City, N. J.  
**Dunbar Bros.**, Bristol, Conn.  
**Miller & Van Winkle**, Brooklyn, N. Y.  
**Morgan Spring Co.**, Worcester, Mass.  
**Roland, Wm. & Harvey**, Phila., Pa.  
**Sabin Machine Co.**, Montpelier, Vt.  
**Washburn & Moen Mfg. Co.**, Worcester, Mass.  
**Wolff, R. H. & Co., Ltd.**, 118th St. and Harlem River, N. Y.
- Spring Rives.**  
**Bommer Bros.**, Brooklyn, N. Y.  
**Chicago Spring Butt Co.**, Chicago, Ill.  
**Pullman Sash Balance Co.**, Rochester, N. Y.  
**Stover Mfg. Co.**, Freeport, Ill.  
**Van Wagoner & Williams Hdw. Co.**, 14 Warren St., N. Y.
- Stamping Works.**  
**Avery Stamping Co.**, Cleveland, O.  
**Cleveland Stamping & Tool Co.**, Cleveland, O.
- Staples.**  
**Cobb & Drew**, Plymouth, Mass.  
**Titchener, E. H. & Co.**, Binghamton, N. Y.
- Steam Gauges.**  
**Bristol Co.**, Waterbury, Conn.  
**Star Brass Mfg. Co.**, Boston, Mass.
- Steam Hammers, &c., Makers of.**  
**Dienelt & Elsenhardt**, Philadelphia.  
**Dudgeon, Richard**, 24 Columbia Street, N. Y.  
**Trethewey Mfg. Co.**, Pittsburgh, Pa.  
**Wood, Wm. H.**, Media, Pa.
- Steam Heating & Oil Separators.**  
**Webster, Warren & Co.**, Camden, N. J.
- Steam Separators.**  
**Harrison Safety Boiler Wks.**, Phila., Pa.  
**Webster, Warren & Co.**, Camden, N. J.
- Steam Specialties.**  
**D'Este & Seely Co.**, Boston, Mass.  
**Lunkenhelmer Co.**, Cincinnati, O.
- Steam Traps.**  
**D'Este & Seely Co.**, Boston, Mass.
- Steel, Cold Rolled Strip.**  
**Superior Steel Co.**, Pittsburgh, Pa.  
**Wilmot & Hobbs Mfg. Co.**, Bridgeport, Conn.
- Steel Figures and Alphabet.**  
**Hoeft, C. W.**, 52 Fulton St., N. Y.  
**Krogard, W.**, 61 Fulton St., N. Y.
- Steel Importers.**  
**Abbott Wheelock & Co.**, N. Y. and Boston.  
**Hobson, Francis, Seaman & Co.**, 97 John St., N. Y.  
**Jessop, Wm. & Sons**, Sheffield, England, or 41 John, N. Y.  
**Milne, A. & Co.**, 1 Broadway, N. Y.  
**Newton & Shipman**, 83 John, N. Y.  
**Wetherell Bros.**, 63 Liberty St., N. Y.  
**Whitney, A. R. & Co.**, B'dway, N. Y.  
**Wolff, R. H. & Co., Ltd.**, 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**  
**Jones, B. M. & Co.**, Boston.
- Steel Manufacturers.**  
**Atna-Standard Iron & Steel Co.**, Bridgeport, O.  
**Bethlehem Iron Co.**, S. Bethlehem, Pa.  
**Baker, Hermann & Co.**, 103 Duane St.  
**Carbon Steel Co.**, Pittsburgh, Pa.  
**Chester Steel Castings Co.**, Phila., Pa.  
**Chrome Steel Works**, Brooklyn, N. Y.  
**Crescent Steel Co.**, Pittsburgh, Pa.  
**Frankford Steel Co.**, Philadelphia.  
**Gautier Steel Department of Cambria Iron Co.**, Johnstown, Pa.  
**Hobson, Francis, Seaman & Co.**, 97 John St., N. Y.  
**Jessop, Wm. & Sons**, Sheffield, England, or 41 John, N. Y.  
**Kayser, Edmon & Co.**, Sheffield, Eng.  
**La Belle Steel Co.**, Pittsburgh, Pa.  
**Landon Iron Co.**, Salisbury, Conn.  
**Lukens Iron & Steel Co.**, Coatesville, Pa.  
**Moorhead-McCleane Co.**, Pittsburgh, Pa.  
**Moss, F. W.**, 83 John, N. Y.  
**Pottsville Iron and Steel Co.**, Pottsville, Pa.  
**Bowland, Wm. & Harvey**, Frankford, Philadelphia.  
**Singer, Nimick & Co.**, Pittsburgh.  
**Superior Steel Co.**, Pittsburgh, Pa.  
**Valley Steel Co.**, St. Louis, Mo.  
**Wordlaw, S. & C.**, Sheffield, Eng.  
**Wetherell Bros.**, 63 Liberty St., N. Y.  
**Wilmot & Hobbs Mfg. Co.**, Bridgeport, Conn.
- Steel Manufacturers' Agents.**  
**Barns, C. K. & Co.**, Philadelphia, Pa.  
**Butze, Adolph**, St. Louis, Mo.  
**Corning, Edw. & Co.**, 29 B'way, N. Y.  
**Lindsay, Jas. G. & Co.**, Phila., Pa.  
**Pierston & Co.**, 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**  
**Bethlehem Iron Co.**, S. Bethlehem, Pa.  
**Cambria Iron Co.**, Johnstown, Pa.  
**Montour Iron & Steel Co.**, Danville, Pa.  
**Riverside Iron Wks.**, Wheeling, W. Va.
- Steel, Tool.**  
**Frankford Steel Co.**, Philadelphia, Pa.  
**Jessop, Wm. & Sons**, Sheffield, England, 91 John, N. Y.  
**Jones, B. M. & Co.**, Boston, Mass.  
**La Belle Steel Co.**, Pittsburgh, Pa.
- Step Ladders, Rolling.**  
**Bicycle Step Ladder Co.**, Chicago, Ill.  
**Coburn Trolley Track Mfg. Co.**, Holyoke, Mass.  
**Croissant, M.**, Albany, N. Y.
- Stocks and Dies.**  
**Armstrong Mfg. Co.**, Bridgeport, Conn.  
**Billings & Spencer Co.**, Hartford, Conn.  
**Butterfield & Co.**, Derby Line, Vt.  
**Hart Mfg. Co.**, Cleveland, O.  
**Oster Mfg. Co.**, Cleveland, O.  
**Saunders' Sons, D.**, Yonkers, N. Y.  
**Wells Bros. & Co.**, Greenfield, Mass.  
**Wiley & Russell Mfg. Co.**, Greenfield, Mass.
- Stone Saws and Planers.**  
**Lincoln Iron Works**, Rutland, Vt.
- Store Fixtures.**  
**Wernicke Co.**, Minneapolis, Minn.
- Stove Linings.**  
**Ostrander Fire Brick Co.**, Troy, N. Y.
- Stove Pipe Thimbles.**  
**Cheney, S. & Son**, Manlius, N. Y.
- Stove Trucks.**  
**Gwinner Mfg. Co.**, Hamilton, Ohio.  
**Tucker & Dorsey Mfg. Co.**, Indianapolis, Ind.
- Street Lamps.**  
**Steam Gauge & Lantern Co.**, Syracuse, N. Y.
- Structural Iron Work.**  
**Berlin Iron Bridge Co.**, East Berlin, Conn.  
**Lindsay, Jas. G. & Co.**, Phila., Pa.
- Structural Tubing.**  
**National Structural Tubing Co.**, Poter Bldg, N. Y.
- Sulphuric Acid.**  
**Mathlessen & Hegeler Zinc Co.**, La Salle, Ill.
- Tacks, Brads, Staples, &c.**  
**Atlas Tack Corporation**, Boston, Mass.  
**Chess Bros.**, Pittsburgh, Pa.  
**Clendenin Bros.**, Baltimore, Md.  
**Cobb & Drew**, Plymouth, Mass.  
**Grand Crossing Tack Co.**, Grand Cross, Ill.  
**Shelton Co.**, Birmingham, Conn.
- Tack and Nail Machinery.**  
**Kimball Bros. & Co.**, Brockton, Mass.  
**Stanley, Geo. W. Co.**, Belleville, Ill.  
**Sweetser, W. A.**, Brockton, Mass.
- Taps and Dies.**  
**Butterfield & Co.**, Derby Line, Vt.  
**Carpenter, J. M.**, Tap & Die Co., Pawtucket, R. I.  
**Manning, Maxwell & Moore**, 111 Liberty St., N. Y.  
**Wells Bros. & Co.**, Greenfield, Mass.  
**Wiley & Russell Mfg. Co.**, Greenfield, Mass.
- Telephones.**  
**Harrison, W. P. & Co.**, Columbus, O.
- Testing Laboratories.**  
**Riehle Bros. Testing Mach. Co.**, Philadelphia.
- Testing Machines.**  
**Riehle Bros. Testing Mach. Co.**, Phila.
- Theatrical Hardware.**  
**Wollensak, J. F.**, Chicago, Ill.
- Thill Springs.**  
**Sabin Machine Co.**, Montpelier, Vt.
- Thrust Collars.**  
**Gouverneur Mach. Co.**, Gouverneur, N. Y.
- Time Record.**  
**Scattergood, H. W.**, Phila., Pa.
- Tin Plate Machinery.**  
**Lloyd Booth Co.**, Youngstown, Ohio.
- Toe Calks, Steel.**  
**Burke, F. P.**, Boston, Mass.
- Tool Chests.**  
**Am. Tool Co.**, 200 W. Houston St., N. Y.
- Tool Holders.**  
**Armstrong Bros. Tool Co.**, Chicago, Ill.
- Tools.**  
**Brown, R. H. & Co.**, New Haven, Conn.  
**Frax, Jno. S. & Co.**, Bridgeport, Conn.  
**Leavitt Mch. Co.**, Orange, Mass.  
**Logan & Strobbridge Iron Co.**, New Brighton, Pa.  
**Mayhew, H. H. Co.**, Shelburne Falls, Mass.  
**Millers Falls Co.**, 93 Reade, N. Y.  
**Richards, C. F. & Son**, Athol, Mass.  
**Standard Tool Co.**, Athol, Mass.  
**Stanley Rule & Level Co.**, 29 Chambers, Staret, L. S. Co., Athol, Mass.  
**Stevens, J. Arms & Tool Co.**, Chicopee Falls, Mass.  
**Tower & Lyon**, 95 Chambers St., N. Y.
- Tools, Blacksmith and Wheelwright.**  
**Buffalo Forge Co.**, Buffalo, N. Y.  
**Butts & Ordway**, Boston, Mass.  
**Champion Blower & Forge Co.**, Lancaster, Pa.  
**Oster Mfg. Co.**, Cleveland, Ohio.  
**Plumb, Fayette R.**, Philadelphia, Pa.  
**Wiley & Russell Mfg. Co.**, Greenfield, Mass.
- Tools, Steam and Gas Fitters.**  
**Saunders' Sons, D.**, Yonkers, N. Y.
- Torches, Oil and Gasoline.**  
**Dangler Steel & Mfg. Co.**, Cleveland, O.  
**Schneider & Trenkamp Co.**, Cleveland, Ohio.  
**Standard Lighting Co.**, Cleveland, O.
- Tote Boxes.**  
**Clark, W. J. & Co.**, Salem, O.
- Tramway Lifters.**  
**Wollensak, J. F.**, Chicago, Ill.
- Tree Holders.**  
**Allentown Hdw. Works**, Allentown, Pa.
- Trucks, Manufacturers of.**  
**Clark, G. P.**, Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**  
**Ansonia Brass & Copper Co.**, 19 and 21 Cliff, N. Y.  
**Randolph & Clowes**, Waterbury, Conn.
- Tubes, Steel.**  
**Avery Stamping Co.**, Cleveland, O.  
**Lang's, John & Son**, 4 Fletcher St., New York.  
**Shelby Steel Tube Co.**, Shelby, Ohio.  
**U. S. Projectile Co.**, Brooklyn, N. Y.
- Tubing, Structural.**  
**National Structural Tubing Co.**, Poter Bldg, N. Y.
- Tumbling Barrels.**  
**Henderson Bros.**, Waterbury, Conn.
- Turnbuckles.**  
**Central Iron & Steel Co.**, Brazil, Ind.  
**Cleveland City Forge & Iron Co.**, Cleveland, O.  
**Merrill Bros.**, Brooklyn, E. D.
- Twist Drills, Makers of.**  
**Cleveland Twist Drill Co.**, Cleveland.  
**Morse Twist Drill & Machine Co.**, New Bedford, Mass.  
**New Process Twist Drill Co.**, Taunton, Mass.  
**Standard Tool Co.**, Cleveland.
- Valves, Gas, Water and Steam.**  
**Chapman Valve Mfg. Co.**, Boston.  
**Eynon-Evans Mfg. Co.**, Philadelphia, Pa.  
**Jenkins Bros.**, 71 John, N. Y.  
**Lunkenhelmer Co.**, Cincinnati, O.  
**McNab & Harlin Mfg. Co.**, 56 John, N. Y.
- Ventilating Fans.**  
**Huyett & Smith Mfg. Co.**, Detroit, Mich.  
**Perkins, B. F. & Son**, Holyoke, Mass.
- Ventilator Appliances.**  
**Howard & Morse**, 16 Fulton St., N. Y.
- Vise Jaws.**  
**Newark Mch. Tool Co.**, Newark, N. J.
- Vises.**  
**Holands Mfg. Co.**, Erie, Pa.  
**Howard Iron Works**, Buffalo, N. Y.  
**Lewis Tool Co.**, 41 Barclay St., N. Y.  
**Logan & Strobbridge Iron Co.**, New Brighton, Pa.  
**Millers Falls Co.**, 93 Reade St., N. Y.  
**Prentiss Vise Co.**, 44 Barclay, N. Y.  
**Tower & Lyon**, 95 Chambers St., N. Y.
- Wagon Jacks.**  
**Covert's Saddlery Works**, Farmer, N. Y.
- Washboards.**  
**Olds Wagon Wks.**, Ft. Wayne, Ind.
- Washers.**  
**Haskell, Wm. H. Co.**, Pawtucket, R. I.  
**Milton Mfg. Co.**, Milton, Pa.  
**Sternbergh, J. H. & Son**, Reading, Pa.
- Washing Machines.**  
**Old Wagon Works**, Ft. Wayne, Ind.  
**Richmond Cedar Wks.**, Richmond, Va.
- Water Meters.**  
**Watlington, Henry R.**, 86 & 88 Liberty St., N. Y.
- Water Wheels.**  
**Poole, Robt. & Son Co.**, Baltimore, Md.
- Wheelbarrows.**  
**Bryan Mfg. Co.**, Bryan, Ohio.  
**Sidney Steel Scraper Co.**, Sidney, O.  
**Thomas, G. W. & Co.**, Toledo, O.  
**Withington & Cooley Mfg. Co.**, Jackson, Mich.
- Wheels.**  
**Arnold Metal Wheel Co.**, New London, Ohio.
- Window Cord, Makers of.**  
**Samsom Cordage Works**, Boston, Mass.
- Wire, Manufacturers of.**  
**American Wire Co.**, Cleveland, Ohio.  
**Baackes & Co.**, Pittsburgh, Pa.  
**Cincinnati Barb Wire Fence Co.**, Cincinnati, O.  
**Gautier Steel Department of Cambria Iron Co.**, Johnstown, Pa.  
**Miller & Van Winkle**, Brooklyn, N. Y.  
**New Castle Wire Nail Co.**, New Castle, Pa.  
**New Haven Wire Mfg. Co.**, New Haven, Conn.  
**Salem Wire Nail Co.**, Salem, O.  
**Stewart Wire Co.**, Easton, Pa.  
**Trenton Iron Co.**, Trenton, N. J.  
**Washburn & Moen Mfg. Co.**, Worcester.  
**Wetherell Bros.**, 63 Liberty St., N. Y.  
**Wolff, R. H. & Co., Ltd.**, 118th St. and Harlem River, N. Y.  
**Wright & Colton Wire Cloth Co.**, Worcester, Mass.
- Wire Cloth.**  
**Barnum, E. P.**, Detroit, Mich.  
**California Wire Works**, San Francisco, Cal.  
**Clinton Wire Cloth Co.**, Clinton, Mass.  
**Darby, Edward & Sons**, Philadelphia.  
**Essey, W. S.**, 65 Fulton, N. Y.  
**Gilbert & Bennett Mfg. Co.**, 42 Cliff, N. Y.  
**Howard & Morse**, 45 Fulton, N. Y.  
**Ludlow-Saylor Wire Co.**, St. Louis, Mo.  
**N. J. Wire Cloth Co.**, Trenton, N. J.  
**New York Wire Cloth Co.**, 102 Chambers St., N. Y.  
**Scheeler & Sons**, Buffalo, N. Y.  
**Wickwire Bros.**, Cortland, N. Y.  
**Wright & Colton Wire Cloth Co.**, Worcester, Mass.  
**W. S. Tyler Wire Works Co.**, Cleveland.
- Wire Cutters.**  
**Higganum Hdw. Co.**, Higganum, Conn.  
**King, J. M. & Co.**, Watertown, N. J.
- Wire Dies.**  
**McFarland, Wm.**, Trenton, N. J.  
**Newton & Shipman**, 83 John St., N. Y.
- Wire Dowels.**  
**Bond Nail Co.**, Raynham, Mass.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**  
**Am. Wire Goods Co.**, Lowell, Mass.  
**Darby, Edward & Sons**, Phila.  
**Gilbert & Bennett Mfg. Co.**, 42 Cliff St., N. Y.  
**Ludlow-Saylor Wire Co.**, St. Louis.  
**Meyers, Fred J. Mfg. Co.**, Hamilton, O.  
**New York Wire Cloth Co.**, 102 Chambers St., N. Y.  
**Scheeler & Sons**, Buffalo, N. Y.  
**Wickwire Bros.**, Cortland, N. Y.  
**Williamson, C. T.**, Wire Novelty Co., Newark, N. J.  
**Wire Goods Co.**, Worcester, Mass.
- Wire Hangers.**  
**Barber-Koenig Mfg. Co.**, Hazleton, Pa.
- Wire Machinery.**  
**Am. Tool Wks.**, Cleveland, O.  
**Manville, E. J. Mch. Co.**, Waterbury, Ct.  
**Morgan Construction Co.**, Worcester, Mass.  
**Waterbury Mch. Co.**, Waterbury, Conn.
- Wire Nail.**  
**Baackes & Co.**, Pittsburgh, Pa.  
**California Wire Works**, San Francisco, Cal.  
**Indiana Wire Fence Co.**, Crawfordsville, Ind.  
**Kilmer Mfg. Co.**, Newburg, N. Y.  
**New Castle Wire Nail Co.**, New Castle, Pa.  
**Salem Wire Nail Co.**, Salem, O.  
**Taunton Wire Nail Co.**, Taunton, Mass.  
**Whitney, A. R. & Co.**, New York City.
- Wire Rods, Steel.**  
**American Wire Co.**, Cleveland, Ohio.  
**Baackes & Co.**, Pittsburgh, Pa.  
**New Castle Wire Nail Co.**, New Castle, Pa.  
**Washburn & Moen Mfg. Co.**, Worcester, Mass.  
**Whitney, A. R. & Co.**, 17 B'way, N. Y.  
**Wolff, R. H. & Co., Ltd.**, 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.**  
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**California Wire Works**, San Francisco.  
**Hazard Mfg. Co.**, Wilkesbarre, Pa.  
**A. Leschen & Sons Rope Co.**, St. Louis.  
**Trenton Iron Co.**, Trenton, N. J.  
**Washburn & Moen Mfg. Co.**, Worcester, Mass.
- Wire Rope Machinery.**  
**Kay, J. F.**, Passaic, N. J.
- Wire, Spool.**  
**Malin & Co.**, Cleveland, O.
- Wire Straightening and Cutting Machinery.**  
**Adt, John & Son**, New Haven, Conn.
- Wood Turning.**  
**Cleveland Wood Turning Co.**, Cleveland, O.
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**Fay, J. A. & Co.**, Cincinnati, O.  
**Seneca Falls Mfg. Co.**, Seneca Falls, N. Y.
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**Bemis & Call Hardware & Tool Co.**, Springfield, Mass.  
**Billings, Spencer & Co.**, Hartford, Conn.  
**Coes Wrench Co.**, Worcester, Mass.  
**Tower & Lyon**, 95 Chambers St., N. Y.  
**Trumont Mfg. Co.**, Roxbury, Pa.  
**Walworth Mfg. Co.**, Boston, Mass.
- Wringers.**  
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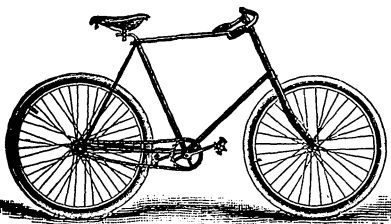
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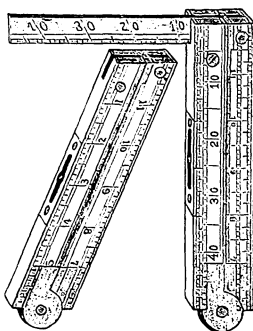
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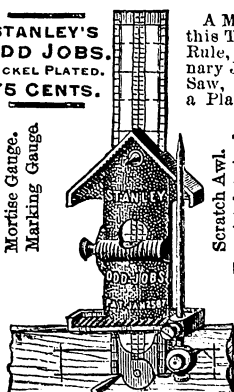
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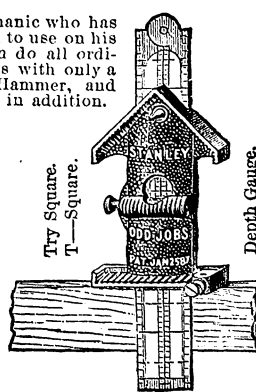
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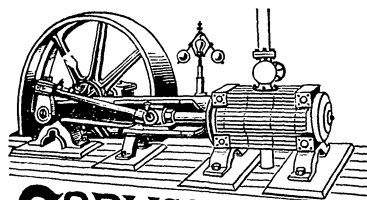
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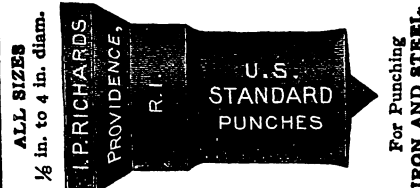


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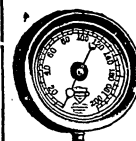
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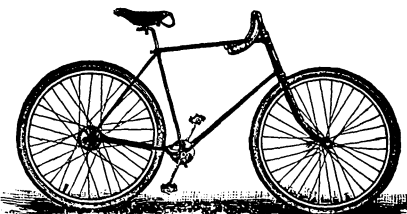
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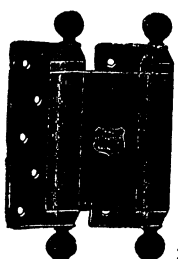
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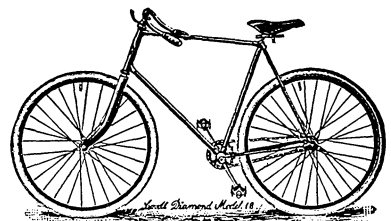
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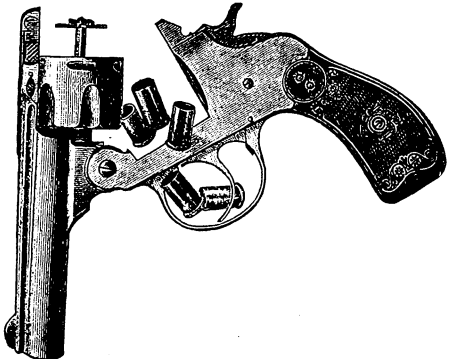
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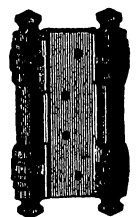
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# THE IRON AGE

THURSDAY, DECEMBER 6, 1894.

## A Substitute for Rifling Guns.

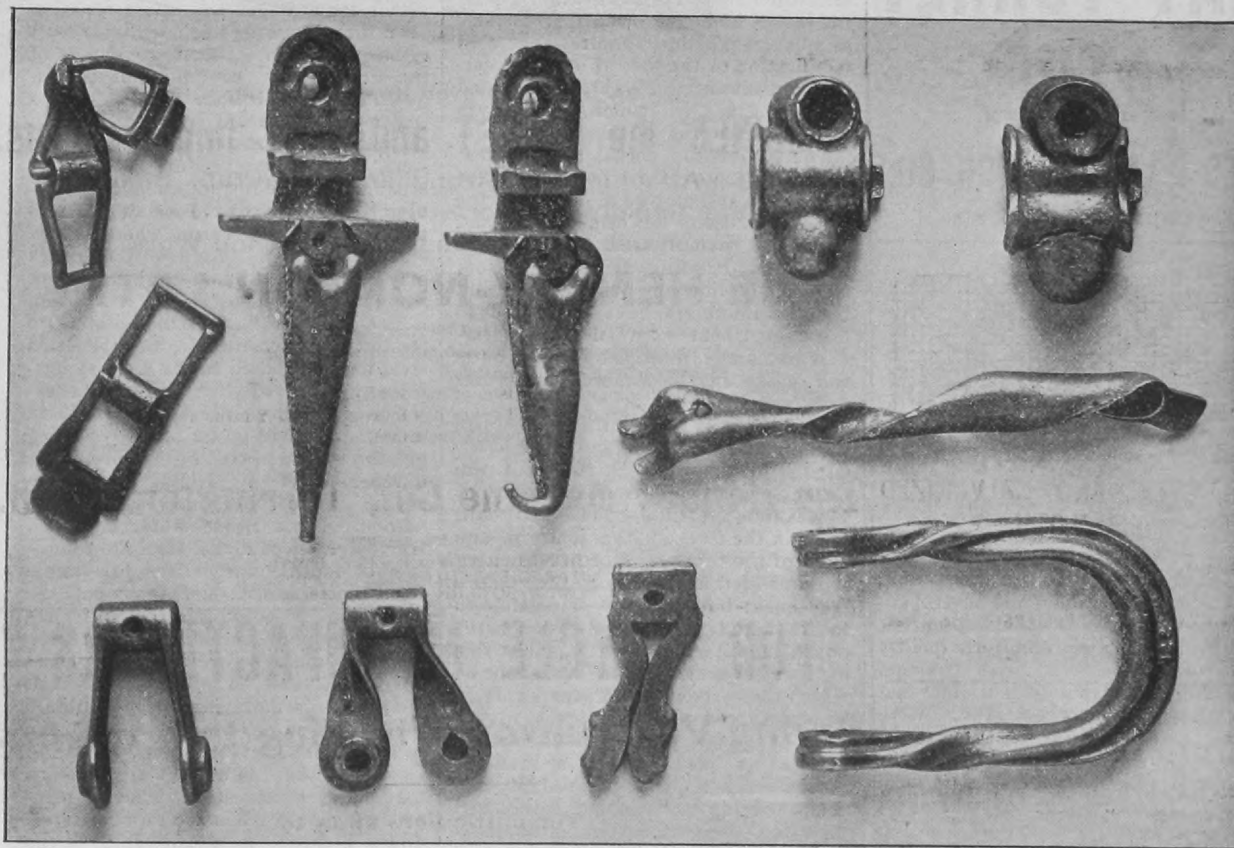
The heavy cost of modern guns is largely due to the time and labor which are necessarily expended upon the operation of rifling them. The material itself is relatively cheap, but a rifled gun, besides being much more costly, is, speaking broadly, more short lived than a smooth bore. It is extremely difficult so to build the gun and the projectile that the soft driving bands of the latter shall, at the moment of discharge, accurately fit into the grooves of the bore and allow no gases to pass ahead. When these gases do pass ahead of the projectile they score and injure

either constant or increased. He has satisfied himself that the effect upon the projectile is exactly the same as is produced by the constant or increasing twist of an ordinary rifled gun; and he is of opinion that the adoption of his system, while giving equal or even improved accuracy of fire, will reduce the cost of heavy guns by one-half and add fully 100 per cent. to their endurance.

## Malleable Castings from Coke Pig Iron.

References have been made in these columns from time to time regarding the increasing use of coke pig iron in

proper parties entitled to the credit of discovering the adaptability of Bessemer pig iron for this purpose. The malleable foundrymen state that they first ascertained as nearly as possible the elements required in pig iron for their work, after which they began to experiment, and with the aid of the furnacemen achieved success. The furnacemen claim that they knew from their familiarity with the analysis of pig iron that coke Bessemer contained the same elements in about the same proportions as the best Lake Superior charcoal, and they, therefore, confidently pressed the former on the attention of malleable iron makers. However, there is no doubt upon the main



TESTS OF MALLEABLE IRON CASTINGS MADE FROM COKE IRON.

the interior of the gun, and where the new powders are used and the gases of combustion attain an extraordinary degree of heat the process of deterioration, especially in weapons of large caliber, is frequently very rapid.

The London *Times* mentions that a Swedish engineer, W. T. Unge, has devised a method by which he hopes to save, not only the cost of rifling, but to do away in a large measure with the interior wear and tear incidental to rifling. He proposes to construct all guns as smooth bores, and to fit the projectiles with gas checks which shall render it practically impossible for any gases to rush past them. In order to convey to the projectile an axial rotary motion, such as is at present conveyed to it by the action of the rifling, he has invented a mechanical arrangement which, at the instant of firing, gives to the gun itself an axial rotary motion. This may be

producing malleable castings. The practice is not referred to as entirely new. Makers of malleable castings have for a long time experimented more or less with coke iron in the endeavor to substitute it for the considerably dearer Lake Superior charcoal iron. Nevertheless, it is but recently that coke iron has secured a substantial footing in the malleable trade. The beginning of this new growth dates back about three years to experiments made by Western malleable makers with coke Bessemer. Up to that time the attempt to use coke iron had been confined to the mixture of a high quality of foundry iron with the usual charcoal brands, which sometimes gave fair results and at other times did not. But when Bessemer iron began to be introduced in the trade the good results became apparent immediately. Some little uncertainty exists as to the

point, which is that both the furnacemen and the foundrymen co-operated with each other in the experiments made during the first stages of this new departure, and when it was necessary to be thoroughly satisfied upon every point.

Illustrations are presented herewith of a number of samples of malleable castings made by the Northwestern Malleable Iron Company of Milwaukee, Wis. These castings are mainly shown in duplicate, a perfect casting being connected with one which has been subjected to torture. It will be seen that the latter have endured very severe punishment without injury. They do not show the slightest indication of giving way at any point. The button, which has been swaged out, is considered a remarkable test. The hole has been enlarged nearly three times, and the diameter of the button in-

creased accordingly. The metal shows really wonderful tenacity. These samples were all hammered or twisted cold, and they were not selected, but were taken out of stock indiscriminately. These castings contain 85 per cent. of coke iron, made by the Illinois Steel Company, for whom Pickands, Brown & Co. of Chicago are sole sales agents. They were pioneers in introducing coke Bessemer to the malleable trade.

Frederick W. Slyer, president of the Northwestern Malleable Iron Company, who has kindly supplied these castings for our purpose, says: "We have made excellent castings wholly from coke iron, and see no reason why this is not practicable. Our experience has proved it to be so. With the co-operation of the furnaceman, and knowing the elements required, in our opinion coke iron is the ideal metal for malleable purposes. The composition of the metal we are using at the present time is about as follows: Silicon, 1.65;

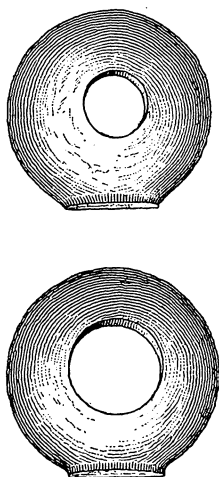


Fig. 2.—Hole Enlarged by Drifting.

manganese, 0.60; phosphorus, 0.09; sulphur, a trace. There are several advantages in the use of this kind of metal, among which is a more uniform quality than we have secured with charcoal iron. Another advantage is the fact that the castings anneal more readily. With an analysis of every car of iron we receive we are enabled to handle our mixture intelligently and with uniform results. To insure accuracy we make a separate pile of each car as it is unloaded, the analysis card being before us all the time when our mixture is being made up. After having proved the constituent elements which are necessary to accomplish the results desired, and depending on the reliability of the furnace for the analysis, we are thus enabled to produce a uniform quality of castings. We think the samples sent you, treated as they have been, should remove the prejudice which perhaps still exists in the minds of some as to the desirability of using coke iron for malleable purposes."

A scheme for utilizing the immense culm piles in the anthracite coal regions emanates from Wilkes Barre, Pa. There are at present millions of tons of this waste product lying around the coal breakers. Capitalists, with headquarters at Scranton and Wilkes-Barre, will, it is announced, use this culm for boiler fuel and generate electricity, which will be transmitted by wire to distant points. The power so supplied is intended either for motive, heating or lighting purposes.

## The Present Status of Face Hardened Armor.\*

BY CAPTAIN W. T. SAMPSON, U. S. N.,  
CHIEF OF BUREAU OF ORDNANCE.

### Difficulties Overcome.

The apparent difficulties which at first delayed the development of face-hardened armor in this country, and which were by some regarded as insuperable, have either disappeared upon closer inspection or been practically overcome. The armor manufacturers have been able to devise methods of controlling, within certain limits, the distortions due to water hardening, and where this distortion occasionally exceeds a practical tolerance, the subsequent rectification has become, with increased experience, more frequently possible without retempering. The tolerances of final shape and dimensions have been made slightly greater than in the case of homogeneous plates to avoid, as much as possible, the stresses of cold rectification or the loss of surface carbon in reheating. This has necessitated arrangements by which, in certain cases, the lengths of the armor bolts are determined by actual measurement after the plate is in position. The shrinkages and change of angles in the various processes of cementation and tempering, complicated as they were by those of bending and rectification, seemed to follow no definite law; still the manufacturers have succeeded in foreseeing them with sufficient clearness to make most satisfactory butts and joints in the armored structures thus far inspected.

The difficulty of securing structures to the hard face, in default of knowledge as to the exact location of the fastenings, is also in course of solution. It was found feasible to tap and drill holes in the face of the plate at any stage of the process prior to hardening without detracting from the plate's resistance; but, as it was impossible to locate these holes with precision without fitting the armor into place, this method was abandoned in favor of one by which the carbon was prevented from penetrating over certain areas in the wake of the fastenings. This method also had its disadvantages in that the carbon gases frequently seeped through the protecting material and carbonized the surface beneath. The most satisfactory method, and one which will probably be employed in the future, is that of electrically annealing the surface to be drilled.

The greatest objection to the face-hardening or Harvey process, and one which seems least likely to be overcome in the immediate future, is its expense. The thickest plates are exposed to high temperatures for weeks at a time, and the charges for repairs, fuel and labor are very great. It seems possible, however, that means may yet be determined for shortening this stage of the process and reducing somewhat the temperature required for cementation. The repeated machining, however, can hardly be dispensed with; shrinkage and distortion occur not only in the hardening, but in the cementation as well. Plates must be at least approximately machined before cementation; they must then be shaped and machined to such dimensions as experience has taught will, after hardening, be satisfactory. Even then it may be necessary

\* From a paper read before the Society of Naval Architects and Marine Engineers.

to anneal, machine, and retemper, before obtaining satisfactory results. These difficulties of the manufacturer, although reduced by skill and experience to the minimum, are likely to remain permanent.

### The Effect of Nickel.

It would not be proper to dismiss the subject of manufacture without considering the effect of nickel upon it. Mr. Ellis, in an able essay delivered before the Association of British Naval Architects in March last, discusses the advantages and disadvantages of nickel in armor plates as treated by the Harvey process in England. In certain respects the experience in the United States is different.

The decision of the Armor Board of 1890 that the Schneider nickel steel plate was softer than that of steel, and allowed greater penetration, was correct for those two plates. Our armor makers, however, have had no difficulty in making oil tempered nickel steel armor far stronger and more resisting than that of simple steel, while it still retained the characteristic toughness of the nickel. To any metallurgist acquainted with the infinitude of results that may be obtained by a variation in the composition and treatment of simple steel, the advantageous possibilities arising from the introduction of so benign an ingredient as nickel must be apparent. In other words, where simple steel is strong and tough, both qualities may be improved by adding the proper amount of nickel.

The susceptibility of nickel steel to treatment is remarkable, and yet this steel may be abused in the most shameful way without failure. For this reason the smaller percentage of losses in manufacture will go far toward wiping out the increased cost of machining the tougher material. Nickel appears to render the carbon more sensitive to hardening, and hence water hardened Harvey plates of nickel steel are toughened at depths hardly affected in simple steel plates. Not only that, but the hardening is accomplished with less risk to the plate, and it is for this reason that the manufacturers of the Loire have been able to forego entirely oil-tempering armor plates and obtain the increased resistance due to the more severe operation of water hardening. Doubtless the difficulty of spontaneous hardening, which Mr. Ellis mentions as occurring in carbonized nickel steel plates, is due to the sensitiveness of the alloy after its long heat soaking, the plates being removed from the cementing furnace or uncovered in a cold, moist atmosphere while still at a high temperature. It is very rare that any difficulty of this sort occurs in the United States.

### Higher Percentages of Nickel.

In fact, the only doubt concerning the use of nickel in this country is the feasibility of raising its percentage, now 3.25 per cent., still higher, the improvement and cheapening of the processes of reduction having considerably reduced its cost. In this connection it is well to note that in the Pola, Austria, competitive armor trial of November, 1893, a Witkowitz unhardened plate, said to contain 5 per cent. of nickel, defeated five competitors, including a Vickers Harveyed simple steel plate and a Krupp gas hardened plate. These plates contained between 2 and 3 per cent. of nickel. Finally, in England, where the nickel in Harveyed armor rarely exceeds 2.5 per cent., its peculiar toughening effect is taken

advantage of by employing it for unbacked structures, while the Harveyed all steel armor, being more susceptible to racking, is now only fitted on backing. There is, therefore, nothing in the present application of the Harvey process, nor its future possibilities, to indicate the disuse of nickel in armor; rather that by increasing its percentage the toughness of the foundation plate and its resistance as a whole may be increased.

#### American and Foreign Service Tests.

The service tests for Harveyed plates for United States naval vessels require them to withstand two shots, the first delivered with the velocity which, according to the Gâvre formula, would cause the perforation of a wrought iron plate 10 per cent. greater in thickness, together with 36 inches of oak backing, the requirements being that no crack shall extend from the impact to the edge, or from one edge to another of the plate, and at the same time through the entire thickness of the plate at an edge. The second shot is at the velocity which, according to the De Marre formula, would cause the perforation of a Creusot steel plate 15 per cent. greater in thickness, together with 36 inches of oak backing, the requirement in this instance being that the projectile, or any fragment thereof, shall not pass entirely through the plate and backing.

These tests are but 15 per cent. more severe than those required for oil tempered nickel steel plates, and are now 3 per cent. less severe than those fixed by the latest contracts in France. It has been claimed that the larger calibers employed in France make the test more severe. This is hardly the case, as in France cracking is not barred. The plate must resist perforation, no part of the backing must be exposed, and the plate must remain in such condition, as regards cracks, as to enable a second shot to be fired upon it. The velocity of the second shot will be 1.26 as compared with that for ordinary steel as obtained from the De Marre formula, and the blow of this shot shall fall at a point distant 3 to 4 calibers from the first. Should the plate stop this shot, a premium of 8 per cent. of the contract price will be paid. Should the plate fail to fill the conditions imposed for the first shot, then another shot will be fired with a velocity of 12 per cent. greater than that capable of piercing an equal thickness of steel, and if the plate successfully resists this attack, the lot may be accepted, but at a price reduced 8 per cent. below that agreed to in the contract.

It would thus seem that the minimum requirement in France, after all, is hardly as severe as our own; still there are three grades of quality and three prices under the same contract. It must be remembered, however, that the tests in the United States do not, as abroad, fix a standard of excellence. They mark the inferior limit, as does the last shot mentioned in the French contract above. The poorest, not the average, plate in an armor group of from 300 to 500 tons must pass this test or the entire lot is rejected. With the careful inspection of the various delicate operations of manufacture, aided by physical and chemical tests, it has been possible for the inspectors to select a Harveyed plate believed in every instance to be less resisting than any other in the group. Our service plates must, therefore, be regarded as generally exceeding the resistance of the plates tested by a considerable amount.

In the United States the necessity of developing the manufacture of armor has prohibited active competition. It was necessary to place orders and formulate specifications before practical business men could be induced to erect the required expensive plants, hence it was necessary at first to borrow largely from experience abroad. In England and on the Continent, where the armor manufacturers were, at the advent of the Harvey process, provided with plants in which the equipment had followed step by step the advance of the art, contracts are awarded to the firms producing the best material, so that an active competition exists.

Competitive trials are also arranged from time to time, often of an international character, in which the behavior of the best plate submitted determines the requirements which all those made under the contract contended for shall satisfy. The information thus obtained is of great value, not only to the buyers of armor, but the makers of it as well, leading to continual improvement in its quality and the standard of acceptance. It is to be hoped that an actual comparison of the products of our own and foreign armor makers may be arranged at no distant day, if for no other reason than to correct certain false impressions that exist abroad as to the standard of acceptance in this country. Thus far 28 Harveyed plates, all but 7 being of nickel steel, have been tested in the United States, and 40, all of which but 14 were of nickel steel, have been tested abroad. In addition, 9 plates tested were face hardened in various other ways. The owners of these special processes of face hardening have, however, in every instance also acquired the right to Harvey armor.

In England about 20,000 tons of armor of this description have been ordered, the latest contract being for 12,500 tons, intended for the barbettes and citadels of the first-class battleships "Prince George," "Hannibal," "Victorious," "Jupiter," and "Mars." Harveyed armor is now being manufactured for the battleships "Renown," "Majestic," and "Magnificent" in England, the "St. Louis" and "Charlemagne" in France, one Danish vessel and two Japanese.

The great English firms of Cammell, Brown, and Vickers are all provided with Harveying plants. In France, St. Chamond, Chatillon-Commentry, Marel Frères, and St. Etienne have adopted the process, the first three accepting contracts to furnish plates up to a thickness of 15.75 inches, St. Etienne making plates under 8 inches in thickness. Schneider & Co. have also acquired the process, as well as the firms of Krupp, Dillingen, and Witkowitz, all of whom had previously employed special face-hardening processes of their own.

#### Comparison with Homogeneous Plates.

There is naturally a wide range in the comparison of the resistance of homogeneous and Harveyed plates, for, even were the plates before treatment made as uniform in composition and quality as the art permits, the accumulated effect of un contemplated variations in cementation and hardening, especially at different establishments, is sufficiently great to produce a marked difference in their resistance. Equally important are the variations in quality and make of the projectiles. It would be presumptuous, therefore, to state, except in the most general terms, what

the resistance of a Harveyed plate is in terms of that of an iron or simple steel plate of equal thickness. Certain French authorities place the resistance of Harveyed plates at about 1.35 that of simple steel, or 1.80 that of iron. English authorities regard the results of the trial of a 6-inch Harveyed plate as indicating a superiority, when compared with iron, of 1.83. Another French authority states his belief that good Harveyed plates are able to keep out projectiles whose caliber equals their thickness at velocities of from 1968 feet to 2132 feet. American plates compare very favorably with these estimates, Carnegie 6-inch plates having kept out 6-inch projectiles with velocities up to 2110 feet s., exhibiting a resistance, as compared with iron, of 1.93; while a Bethlehem 8-inch plate kept out an 8-inch projectile with a velocity of 2004 feet s., showing a resistance 2.14 times that of iron. Nevertheless, the unjust and erroneous comparison is frequently made of the severity of the acceptance tests of armor in this country and the competitive tests abroad.

It is difficult to explain some of the errors of an essayist in the journal *Le Génie Civil* of August last, who confuses the trials of our homogeneous oil tempered and Harveyed plates and calls attention to the low velocity with which the former are attacked in comparison with those employed against face hardened armor abroad. The American oil tempered plates classed by him with Harveyed armor are as follows: The "Indiana's" 13-inch B. L. R. turret (actually the "Indiana's" 14-inch diagonal armor), manufactured by the Bethlehem Iron Company, and tested May 21, 1892. The "Monterey's" 12-inch B. L. R. turret, manufactured by the Carnegie Steel Company. The "Monadnock's" 11.5-inch barbette plate. This plate in the table is classed as a Bethlehem plate, in the text as manufactured by the Carnegie Steel Company. The latter is correct. The plate contained an extensive defect in its upper end. In discussing the trial of the 18-inch side armor plates for the "Indiana," the velocity of the first shot is given as that merely necessary to perforate 18 inches of iron instead of of 19 8 inches of iron and 36 inches of oak backing. There are many other errors unfavorable to American armor in this essay, which are all the more remarkable as the press of this country, invariably well informed, has correctly reported the trials in every instance.

It is still more difficult to exercise forbearance when, in discussing actual Harveyed plates, he gives undue attention to plates acknowledged to be radically defective. Such instances are abnormal, the result of rare accidental combinations in the manufacture of individual plates, and in no wise typical of the groups to which they belong. It is manifestly unjust, therefore, to compare rejected plates of this description, selected as the poorest in groups composed of a large number of service plates, with those specially manufactured abroad, and upon which the makers are willing to stake their reputation in competitive tests.

It will be noted in these comparisons, however, that more attention is paid to the severity of the test than to the behavior of the plate in determining its quality, as if we would compare the endurance of structures by the loads they happen to support. The American trials have not had for their object the determination of the ultimate resistance of the plates, except in the case of one or two containing surface cracks,



so much as the test and development of Harvey armor piercing projectiles. Surface cracks occur frequently in the thinner Harvey plates, owing to the rapidity with which local cooling takes place in bending or rectifying, and the limited range of temperatures between which the carbonized surface can follow the tougher and more extensible back. In all of the tests it was found that defects confined to the hardened surface in no case initiate, give direction nor extension to cracks produced by impact. In this respect the conclusion reached is identical with that arrived at in the case of the surface chill cracks of Gruson chilled iron armor. In fact, it has been proposed, by artificially creating such cracks or openings and enlargements of the surface, to expedite and control the depth of cementation, deepen the chill in hardening, and limit the flaking under impact. Analogous to this is the behavior of the plates containing artificial defects, such as rows of rivet holes 1 inch in diameter and 1.25 inches deep crossing the plate and 2 inches through bolt holes.

The above remarks are intended to refer to the practical and commercial status of face hardened armor with regard to the service, rather than its experimental and speculative condition. Necessarily the latter is considerably in advance of the former in so new and complicated a process, especially as the only means of gauging the advances made are involved with the comparative quality of projectiles, themselves in course of development.

#### Capped Projectiles.

Harvey armor has been attacked both in this country and abroad by projectiles fitted with soft steel caps on the plan first devised by Colonel Inglis, of the English Ordnance Committee, in 1883, for trial against compound armor. The theory of these caps is twofold. First, upon impact they are penetrated by the shell point and swaged back along the bourrelet, jacketing and supporting it against rupture until it enters the plate and is supported by the walls of the shot hole. There does not seem much advantage in this procedure, as the point of rupture of the projectile is usually quite near the bourrelet, and the cap would have become too much attenuated and weakened before slipping back to that point to offer much resistance. There is, in fact, reason to believe that the cap does not act in this manner at all, as in no instance has it been possible to discover a trace of it before the plate, where it would probably have remained had it merely served as a support to the projectile. The second and most plausible explanation of the benefit ascribed to the cap is that it acts as a lubricant or sleeve which is carried into the plate surrounded by the jagged fragments of hardened surface. These pieces, incapable of flowing, surround the head of the projectile, scoring and abrading it while preventing the forward flow or displacement of the metal, thus bottling up and bracing the resistance of the plate against the advancing projectile. It is evident that if any part of the cap can be carried into the face of the plate with the projectile, the resistance of this non-viscous material is felt over only a part of the ogival instead of the whole of it. There is strong reason to believe that in the latest tests made in this country with capped shell the quality of the projectile had more to do with its success than the presence of the cap, as in two instances the point of the projectile was

either broken off or mashed in. In all cases, however, the action of the hard, inextensible face surrounding the head of the entering projectile is plainly shown in the spiral scores and grooves cut on the ogival of a shot which has perforated a Harvey plate. When, therefore, we are shown the photographs of French and Russian shells which have either perforated or rebounded after penetrating a Harvey plate, without exhibiting a sign of a scratch, we are compelled to state, in the light of past experience, that the plate was not a good type plate, being too soft, and tough rather than hard.

#### American Projectiles.

It was but recently that foreign compliments were showered upon our projectile makers, who were declared to lead the world in certain respects. It may be most positively asserted that there is no reason to believe they have suddenly lost that position. The advent of Harvey armor, and the necessity of our navy being provided with projectiles capable of piercing it, if such projectiles could be made, were almost simultaneous. The standard of excellence to be struggled for was far in advance of what was, until very recently, regarded as attainable. The improvement in quality, however, has been remarkable. Two months ago our Harvey armor, as mounted on the ships, was regarded as impenetrable to calibers equaling its thickness up to 8 inches, the impact occurring with service muzzle velocity. This was owing to the smashing of the projectiles on the hardened face. Projectiles of the latest design, however, would probably be able to perforate such plates practically undeformed at a fighting range of 1500 yards. It has been reported that the Russians so easily overcame Harvey armor with their special shells that they decided against it in favor of tempered homogeneous plates. They are yet to be heard from in this matter, however, and it is hardly possible that they have followed a policy which, if generally adopted at any time in the history of armor, would have effectually stopped progress. Neither in the arts of the gunmaker nor those of the shipbuilder have the application of improvements been deferred until they appeared fully perfected and final in character. It is only by keeping close up with the advance line that full advantage may be taken of new developments in arts and processes, or the scientific discoveries daily taking place around us.

The theory has been advanced, however, that with the improvement of projectiles—not necessarily capped, as that feature can hardly be regarded as practical and serviceable—the Harvey plate will lose its peculiar advantage now due to its smashing the projectile, and will become really less resisting than a homogeneous plate of equal thickness, on account of the softer body and back of the Harvey plate. This argument is fallacious; the principle of a non-homogeneous hardened face, combined with a decrementally toughened body and back, is correct. The homogeneous plate, as compared with the non-homogeneous, must always be perforated in detail. Should the homogeneous plate of the future be greatly superior to the face hardened plate of to-day, it will be made still more resisting by employing it as the foundation plate to which the process of face hardening is applied.

Whatever conclusion is reached, the fact remains that Harveying in its pres-

ent state has increased the resistance of armor fully 35 per cent. and perhaps 50 per cent., according to the thickness of the plate. It has also brought about a great improvement in the quality of our projectiles, and in doing so has perhaps lost some of the advantage it held over them at first, when subjected to direct impact. Its superiority under inclined impact is nearly as great as it ever was, and it does not seem possible that in this respect the relation between gun and armor will for a long time to come take the old position held in the time of soft armor. Perhaps this relation may be restored, however, should the thickness of armor be reduced to a point allowing no more than the old resistance, in order to distribute it over a larger area or divert the weight thus saved to other uses.

#### Discussion.

W. H. Jacques contributed a written discussion from which we take the following:

So great prominence has been given in this paper to the name Harvey that I desire to say a word on the subject of this revival of case hardening or carbonization. I will not discuss the merits of those who have succeeded in getting their names attached to the various patented methods of surface hardening, but hope that those who deserve it will get the pecuniary benefit. Ellis treated the first thick plate many years ago; Harvey revived this method and with the assistance of the Navy Department secured patents which received attention from abroad because of the prominence our Navy Department gave them. Krupp's method has not, to my knowledge, been publicly described, but the results he has obtained have equaled the best obtained elsewhere. Creusot, by the patent granted Mr. Schneider, has secured a process by which many of her successful plates have been made, while St. Chamond continues to get most excellent results with her nickel-chrome plate without running risks that the carbonization processes entail.

There are two points in connection with the present status of armor to which I ask your special attention, particularly the second.

1. All nations are using all steel armor, and have discarded that type so well known as British compound.

2. The value of nickel as an alloy in armor steel.

Great Britain has acknowledged our supremacy in the armor question and partially imitated our methods, but, for some reason not yet publicly explained, the employment of nickel in armor has been officially announced as an unnecessary increase in the cost of its production. She has decided that the additional cost of the employment of nickel is not justified by the results; that its use causes characteristics which are injurious: but she has made no comparative tests of thick plain steel and nickel steel, such as have specially proved in America the value of nickel in armor steel. Considering the benefits that its use has demonstrated in steel for many other purposes as well as armor, it is difficult to accept this decision on the part of the British Admiralty.

Experiments on both continents show conclusively that the employment of nickel in steel is not only of great benefit to armor but also to steel used for many other war and commercial purposes; and this notwithstanding the conclusions of the British Admiralty that: "In the course of the experiments the use of nickel as an alloy of steel for the purposes of armor plates

has been fully tested. It has been established that Harvey plates without nickel in the steel show resistance to modern projectiles as great as any hitherto obtained when nickel was combined with steel in plates also treated by the Harvey process. The consequence of adopting this new system will be a great saving in cost for a given defense." And of Captain Orde Browne that: "We (Great Britain) have also reason to believe that we have obtained certain distinct advantages in discarding nickel in the case of Harvey plates. In England it has been decided not to use nickel in Harvey plates because the resisting power against penetration is greater without nickel, although toughness is less."

The attempts to demonstrate the value of nickel in steel have been very unfortunate in England and the question naturally arises why is nickel steel so expensive as to preclude its use there? The United States steel workers have had better success with nickel than even French makers, although to Mr. Schneider, of France, belongs the credit of introducing nickel in steel.

it was badly cracked, and the Dutch authorities preferred the St. Chamond plate. I do not know that the Dutch have given to the public a reason for this decision, but a want of uniformity in the results obtained with the surface hardened plates, their distortion in treatment and the apparent brittleness of the Vickers sample, no doubt had much to do with the decision. Perhaps if Vickers had introduced the right proportion of nickel in the composition of his plate, and the plate had been properly worked and treated, he would have won on resistance and not lost on brittleness.

The writer has referred to the attempts to pierce hard faced armor by the application of a soft metal cap to the projectile. This device has excited much attention in Russia, England and elsewhere, and has been tested at our Naval Proving Ground at Indian Head. The difficulty of attaching it securely to the point of the shell—accidents which have been caused by the cap jamming the projectile in the bore—and its disadvantage when angular impact takes place, have produced such uncertain re-

comparative resistance of plates, but equally so in grading projectiles, which in many cases, fired with high velocities, are either lost or not discovered until one of the approximate elements of value—heat—has disappeared.

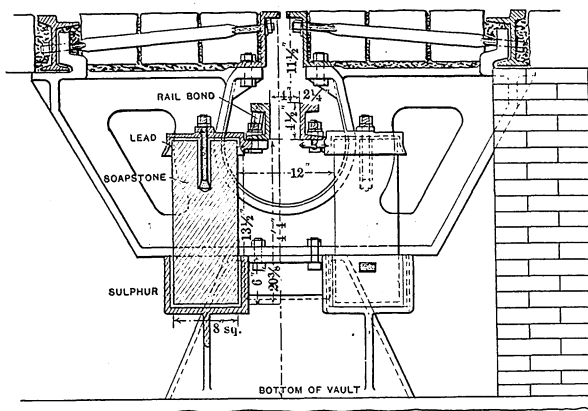
The results obtained in the United States can safely be taken as a standard of what protection can be obtained with various thicknesses of armor, because more serious and numerous tests have been made with each than is the custom in other countries, notably Great Britain. Although England occasionally tests a plate of service thickness her general practice of reducing plates to a thickness of six inches for ballistic acceptance, while supplying a uniform specimen for test and comparison, does not give results that will always hold true in plates of greater thickness, or be a guide for the valuation of the service plates themselves.

### An Electrical Conduit Railway.

Joseph Sachs read an interesting paper on "Is There a Solution of the Electrical Conduit Railway Problem?" at the last regular monthly meeting of the New York Electrical Society. The reasons given for the non-success of the electrical conduit railways thus far were that most of the projects were immature, the inherent difficulties are great and the cost of construction very large. On the other hand, the author thought that the maintenance would seem to be less than with the trolley. After describing a large number of conduit systems, Mr. Sachs said that there was not much of a choice between them, as there had apparently been nothing practical evolved from the extremely large number described, except the plain open slot conduit and continuous wire system. This is the one that is in actual operation, and has given satisfaction both at Budapest and at Blackpool, England, but he considered it doubtful whether it could be made practicable in this country, where the climatic and local conditions are different.

The system which is to be installed upon Lenox avenue by the Metropolitan Traction Company was then described; a section of the conduit is shown in the accompanying cut. The ordinary conduit yoke will be employed and at the main holes, 30 feet apart, the insulators, which are of rectangular form and of soapstone, will be located, and supported in cups embedded in sulphur. At the top of the insulators is fastened an arm of iron. To this arm is fastened a contact conductor of channel iron. The contact shoe comes down to the slot and has two arms which press outwardly from the single supporting bar which rests on the rails, making a continuous rubbing contact. There being two conductors used there is no structural return. As will be seen from the cut, the insulators are located in the manholes and are easily accessible. They are quite a distance apart and the voltage is low, it being intended to use about 250 or 300 volts. The conductors are very nearly directly under the slot, which was apparently the objection in some of the first systems, but the peculiar construction and location of the insulators in this system may prevent any trouble from this source.

Mr. Sachs gives it as his opinion that we will never get a conduit system which can be put in for \$20,000 a mile, single track, and that it may be as high as \$30,000 or \$40,000 per mile, single track.



AN ELECTRICAL CONDUIT RAILWAY.

The two facts mentioned by Mr. Ellis, managing director of John Brown & Co., Sheffield, in his paper on "Recent Experiments in Armor," read before the Institution of Naval Architects, March 15th last, that "the presence of nickel causes steel to crystallize at a much lower temperature than it would otherwise," and that "the arc light system of drilling is not applicable to plates containing a high percentage of carbon and nickel together" have in no way interfered with our producing thick plates of carbonized nickel steel of a most attractive fine grain and fitted with as many holes and bevels as the most exacting sailor or cabinet maker could ask for. Further, the practical evidence which the Krupp, St. Chamond and Bethlehem 8-inch to 17-inch plates furnished as to the value of nickel in steel armor must carry great weight. Individual American plates still have the best record, unless perhaps we except one of Krupp's, and that was nickel steel supercarbonized by a process of his own. Also the best and thickest carbonized service plates ever made were made in the United States and are of nickel steel.

The Texel trials of August 23 and 24, 1893, were interesting, although the dimensions of the plates were small. Brown, Cammell, Krupp, Schneider, St. Chamond and Vickers submitted plates for this trial. All were carbonized except St. Chamond's, which was nickel chrome steel. Although the Vickers plate proved the most resisting,

sults that no definite conclusion has been reached as to the efficiency of this device.

The study of the most suitable velocities for perforation, giving time for a point entrance to hard faced armor, has given data that is at least interesting, if not useful enough to be accepted as final. These trials of types and calibers are of much value to the armor maker and artilleryman, as they assist the former to decide the character of his product and the latter the caliber of his gun, the weight of his projectile and the ballistics he must seek to obtain. Recalling the increase in the number of ships carrying only rapid fire batteries (which now include guns of 6-inch caliber), a very valuable experiment would be to determine the comparative resistance of nickel steel and carbonized plates of thicknesses now considered to be more than a match for rapid fire attack. It is very desirable we should know how they will behave under such conditions.

Although repeatedly suggested, very little has been done to obtain actual remaining energies by the use of screens behind plates in testing armor and projectiles. A large number of the latter perforate the plates and much valuable data could be obtained by their use to replace assumed arbitrary conditions and to lessen the demand upon the Greek alphabet which is so copiously drawn upon to represent the unknown quantities of ballistic equations. Not only is this true in determining the



## Drawback Rates.—I.

The Treasury Department has issued a synopsis of all the decisions rendered during the past few years in regard to drawback rates. We print below those likely to be of interest to the readers of *The Iron Age*.

**Acate Iron Ware:** manufactured by the Lalance & Grosjean Mfg. Company of Woodhaven, N. Y., from imported sheet iron, same as duty paid. Add to the weight of the sheet iron blanks entering into the manufacture the following percentages of said weight, viz: Add for wastage in cutting: All circular blanks, 21½ per cent.; all oval blanks, 11 per cent. Add for wastage in stamping: All circular blanks for milk boilers, 20 per cent.; all circular blanks for Berlin and convex saucepans, and stove pots and sauce pots, 16 per cent.; and all circular blanks for all other stamped goods, 8 per cent. Deduct for value of scrap resulting from finishing all blanks "spun" and "trimmed," 1½ per cent.

**Ajax Metal:** manufactured by Ajax Metal Company, Philadelphia, wholly from imported lead, same as duty paid. Add to net weight exported article 1 per cent.

**Ajax White Metal** from tin and lead, same as duty paid on a quantity of lead equal to one-half of the exported weight.

**Axes:** Axes and hatchets made by the process of splitting the iron and inserting the steel, same as duty paid. Allow for a quantity of iron equal to the net weight of the exported articles, and a quantity of steel equal to 0.166 of such net weight.

**Axes:** manufactured by Collins & Co. of Collinsville, Conn., from steel, same as duty paid. Add 14½ per cent. to exported quantity.

**Axles:** manufactured by the Turl Iron Works of New York, from iron in bars, same as duty paid.

**Axles,** car, and other forgings from wrought scrap iron, same as duty paid. Add 25 per cent. to exported net weight when all the scrap iron used was *old*, and only 12 per cent. if any portion thereof was *new*.

**Barb Wire:** manufactured by the Consolidated Steel & Wire Company of Allentown, Pa., from steel billets made by the Maryland Steel Company of Sparrows Point, Md., from imported iron ore and ferromanganese, delivered to the said Consolidated Steel & Wire Company during the period from July, 1892, to December, 1893, same as duty paid. Quantity determined by allowing for each ton (2240 pounds) of billets, 4618 pounds of iron ore, and 28 pounds of ferromanganese, and for each 100 pounds of wire, 110 pounds of billets, provided that 114 pounds of billets shall be checked off the record of such materials for each 100 pounds of wire.

**Barb Wire Fencing:** manufactured by Iowa Barb Wire Company of Allentown, Pa., wholly or in part from imported material, same as duty paid. Ascertain quantity as follows:

	For every 100 pounds of the exported article.			
	Steel.		Spelter.	
	Identify importation of.	Allow for duty on.	Identify importation of.	Allow for duty on.
Foreign billets and spelter.....	Lbs. 114	Lbs. 110	Lbs. 6.1	Lbs. 4.9
Foreign billets and domestic spelter..	114	110	0.0	0.0
Foreign rods and spelter.....	113.5	102.2	6.1	4.9
Foreign rods and domestic spelter..	103.5	102.2	0.0	0.0

**Barb Wire Fencing:** manufactured by the Iowa Barb Wire Company of Allentown, Pa., wholly from imported steel rods and spelter, same as duty paid; allow 4.9 pounds of spelter and 102.2 pounds of rods for every 100 pounds net, exported article.

**Billets,** steel: shapes manufactured by the Norway Steel & Iron Company of Boston, Mass., wholly from steel billets, same as duty paid. Add 8 per cent. net weight, exported articles.

**Belts** with nuts of domestic materials: manufactured by A. M. Hayden, Philadelphia, Pa., from imported Norway iron, same as duty paid. Deduct from total weight, bolts and nuts, weight of nuts according to following schedule:

Size of bolts.	Weight of nuts per 1000.
Three-sixteenths inch.....	7 pounds.
One-fourth inch.....	12 pounds.
Five-sixteenths inch.....	20 pounds.
Three-eighths inch.....	30 pounds.
Seven-sixteenths inch.....	40 pounds.

**Brass Tubes:** from imported copper and spelter, same as duty paid. Proportion of copper and spelter to be stated in the manufacturer's affidavit on each entry.

**Bridges,** adjusted parts of: manufactured by the Edgemoor Iron Company of Delaware from iron and steel, same as duty paid. Add 5 per cent. to net weight.

**Cans** and boxes from tin plates, same as duty paid. Quantity to be ascertained as follows: For rectangular 5 gallon cans, allow 258 pounds for each hundred cans (made from a combination of plates 14 x 20 inches, with plates 10 x 20 inches) and for each hundred cans made from a combination of plates 14 x 19½ inches with plates 10 x 20 inches, allow 252 pounds. For cans and boxes of other capacities, add to the weight of the blanks the following percentages: On rectangular blanks, 3 per cent.; on body pieces of frustum shaped cans, 7 per cent.; and on circular, elliptical and oval blanks 15 per cent. When no blanks are furnished, the quantity of tin may be determined by adding 5 per cent. to the surface of finished cans to cover seams and wastage.

When articles entitled to drawback on exportation, made wholly from imported tin or terne plates, and on which no allowance for wastage is to be made, are exported in such condition that their weight may be determined by a United States weigher at the time of exportation, such weight shall be accepted as the basis for the liquidation of the drawback entry.

When 5-gallon tin cans are made from a combination of two plates, each 14 x 19½ inches, with one plate 10 x 20 inches, all standard IC tin plates, the quantity of plate used in their manufacture may be determined by allowing 2½ pounds for each can exported; provided that, should the plates used be shown by the records of importation to weigh less than 2½ pounds, the rate here fixed shall be correspondingly reduced.

The superficial quantity of tin or terne plates used in the manufacture of boxes or cans other than the 5-gallon can above noted, or of other articles made from such plates, may be determined by measurement of the blanks or parts of which the box, can or article is composed, and by the addition to surface quantity of the respective parts, to cover wastage in manufacture, of the following percentages:

	Per cent.
For rectangular blanks.....	3
For body pieces of frustum-shaped cans. 7	
For circular and oval blanks.....	15

The number of square inches of plate used being so found, the weight thereof may be determined by dividing such number of square inches by the number of square inches of plate in a box of the size identified by the manufacturer, and multiplying the weight per box on which duty was paid on importation by the number of boxes so found.

In case blanks for cans, boxes or other manufactures of tin or terne plate are in such form that the superficial quantity of plate appearing therein cannot be readily determined by measurement, such superficial quantity may be found by weighing a measurable section cut from such blank and comparing its weight with the weight of the blank. When a sample of the scrap resulting from the cutting of such blank is furnished with the sample blanks required for the use of the collector, the amount of plate used in the manufacture of the articles or parts in which such blanks appear may be determined by adding to the blanks, to cover wastage in manufacture, a quantity of plate equal to that part of the scrap resulting from cutting such blanks, which is rendered worthless for the ordinary uses of tin terne plate, provided that such allowance shall in no case exceed 25 per cent. of the weight of such blanks, except

under special instructions from the Department.

When articles are made from uncut plates or from rectangular blanks cut from plates from which the rough edges have not been trimmed in process of manufacture, no allowance shall be made for wastage.

In case samples of cans or boxes and blanks (when blanks do not so appear in the finished articles that they may be measured) are not furnished by the exporter, the quantity of the material used may be determined by adding 5 per cent. to the surface measurement of the finished article, to cover seams and wastage in manufacture.

**Cans,** from tin plates, completed, with the exception of soldering (blanks), same as duty paid. The exported quantity determined by a United States weigher.

**Cans,** cracker, from tin plates and glass, same as duty paid. Exported quantity determined by measurement of the pieces before they are put together.

**Caramel Tins:** manufactured by Ginna & Co., New York, from imported tin plate, 14 x 20 inches, weighing 85 pounds per box of 112 sheets, same as duty paid. Allow for every 165 caramel tins exported one sheet of tin plate, size and weight indicated above, provided no scrap tin is used.

**Carpet Sweepers:** manufactured by the Bissell Carpet Sweeper Company, Grand Rapids, Mich., from tin plate of IX quality, 14 x 20, same as duty paid. Allow 140 square inches of tin plate for each sweeper.

**Carriage Bolts** and tire bolts: manufactured by Welsh & Lea of Philadelphia, Pa., bolts from imported iron, nuts attached thereto of domestic material, same as duty paid on imported iron; deduct from weight of exported articles the weight of the nuts attached to the different kinds and sizes of bolts, and add to weight of finished bolts for wastage, as follows:

Size of bolt.	Weight of nuts per 1000.	Wastage of material per 1000.	
		Carriage bolts.	Tire bolts.
	Pounds.	Pounds.	Pounds.
Three-sixteenths inch.....	7	2	1½
One-fourth inch.....	10	3½	1½
Five sixteenths inch.....	20	6	1½
Three-eighths inch.....	30	9½	1½
Seven-sixteenths inch.....	50	11	1½

**Cartridge Shells,** unprimed: manufactured by the Winchester Repeating Arms Company of New Haven, Conn., from brass cups, same as duty paid. Add 8 per cent. to the net weight.

**Castings** from pig iron, same as duty paid. Add 6 per cent. to imported weight to cover wastage.

**Castings** from pig and scrap iron, same as duty paid. Allow 100 pounds of material for each 90 pounds of the exported.

**Chains,** from bar iron, same as duty paid. Add 4 per cent. to exported quantity to cover wastage in manufacture.

**Clock Springs:** manufactured by R. H. Wolff & Co., Limited, New York, from steel wire rods, same as duty paid. Add 16 per cent. net weight.

**Clock Springs:** from steel, same as duty paid. Add 13 per cent. to exported weight to cover wastage in manufacture.

**Corrugated Iron** roofing, painted, from sheet iron, same as duty paid on the iron. Deduct 4 per cent. from exported weight on account of weight of the paint.

**Corrugated Strap** and **T-Hinges:** manufactured by the Stanley Works of New Britain, Conn., in part from imported steel billets, same as duty paid. Add to net weight of several classes and sizes exported the following percentages: For class 935, size 4 inches, 16.2 per cent.; for class 935, size 5 inches, 12 per cent.; for class 935, size 6 inches, 6.8 per cent.; for class 935, size 8 inches, 6.2 per cent.; for class 935, size 10 inches, 3.5 per cent.; for class 937, size 5 inches, 6.6 per cent.; for class 937, size 6 inches, 11.3 per cent.; for class 937, size 8 inches, 4 per cent.; for class 937, size 10 inches, 7.2 per cent.

**Drills,** round bar, made from square steel bars, same as duty paid on quantity and as stated in entry if wastage does not exceed 2 per cent.

**Dust Pans**, embossed tin trays: manufactured by Leo Schlesinger & Co., same as duty paid; add to weight exported articles for 13-inch round trays, 22 per cent.; for dust pans, 2 per cent.

**Embossed Tin Cuspidors**: manufactured by David Block of New York wholly from imported tin plate, same as duty paid. Add to net weight of exported goods 33 per cent.

**Embossed Tea Trays**: manufactured by Franklin Hallet & Co., Philadelphia, Pa., same as duty paid. For all sizes round and oval trays add 25 per cent. Allow for all sizes, square, oblong and rectangular trays equal weight.

**Embossed Tin Trays**: manufactured by the Palmer Mfg. Company of New York City, same as duty paid. Add to net weight 10-inch round trays, 41 per cent.; 12-inch round trays, 41 per cent.; 13-inch round trays, 37 per cent.; 14-inch round trays, 27 per cent.; 8 x 11 oval trays, 66 per cent.; 13-inch square trays, 9 per cent.; 11 x 14 oblong trays, 7 per cent.

**Emery**, pulverized or ground, from emery ore, same as duty paid. Add 4 per cent. to net weight.

**Fencing**, barbed wire, by Iowa Barbed-Wire Company of Easton, Pa., from Bessemer steel rods and spelter, same as duty paid. Allow 94 pounds of steel rods and 8 pounds of spelter for each 100 pounds of the exported fencing.

**Ferrules**: manufactured by John L. Parker & Co., Worcester, Mass., wholly from imported bar iron, same as duty paid. Add to net weight exported articles 42 per cent. of such weight.

**Forks**, manure, from steel, same as duty paid, quantity to be stated in entry, not to exceed 15 per cent. of exported weight.

**Galvanized Barbed Wire**: manufactured by the Washburn & Moen Mfg. Company, Worcester, Mass., steel blooms and domestic spelter. Strands No. 12½, and barbs No. 14, wire gauge, same as duty paid. Deduct 2.27 per cent. from net weight of spelter; add to weight so found 13.3 per cent. for wastage.

**Galvanized Fencing**: manufactured by Buck Thorn Fence Company of Trenton, N. J., wholly from imported steel and spelter, same as duty paid. Allow for each 100 pounds of the fencing known as "Buck Thorn" 107.3 pounds of steel and 12.6 pounds of spelter, and of the fencing known as "Forms No. 1" and "No. 2," 95.1 pounds of steel and 12.6 pounds of spelter.

**Galvanized Wire Handles** to tin cans, made wholly from galvanized wire, No. 9, manufactured from imported spelter, and iron rods, or bars, billets, or blooms, and attached to tin cans, same as duty paid. Allow for each 1000 handles weighing not less than 31 pounds to the 1000, 1.55 pounds of spelter, and, as the case may be, 31 pounds iron rods, or 33 pounds of iron bars, billets, or blooms; and for each 1000 handles weighing not less than 28 pounds to the 1000, 1.4 pounds of spelter and 28 pounds of iron rods, or 31 pounds of iron bars, billets, or blooms.

**Gunpowder** from saltpeter which paid a duty of 1 cent per pound; American sporting, 0.8 cent per pound; United States Government, 0.8 cent per pound; shipping and mining, 0.7 cent per pound.

**Gun trimmings and systems** made for the Martini-Henry rifle, same as duty paid. The quantity of materials used in the manufacture shall be determined by allowing for each receiver 3.66 pounds steel; for each block 1 pound iron; for each guard, 1 pound iron; for each lever, 0.8 pound iron; for each set of bands, 0.45 pound iron; for each sight base, ¼ pound iron; for each butt plate, ½ pound iron; for each bayonet, 1.84 pounds iron.

**Handles and high tin nozzles**: manufactured by the Devos Mfg. Company, New York, from imported tin plate attached to 5-gallon tin cans, same as duty paid on 3.36 pounds tin plate for each 100 handles, and on 5.22 pounds for each 100 nozzles.

**Handles made from zinc** and attached to tin cans, 12½ cents per 100.

**Hvy Knives**: manufactured by the Hiram Holt Company of East Wilton, Maine, in part from imported iron, same as duty paid. Allow not more than 30 pounds of iron for each dozen knives weighing not less than 52 pounds per dozen.

**High Zinc Nozzles**: manufactured by the Devos Mfg. Company, New York, from imported No. 8 and No. 9 sheet zinc, same as duty paid. Allowance limited to 12½ cents per 100 nozzles. Affidavit must identify 2.63 pounds No. 8 and 4.17 pounds No. 9 sheet zinc each 100 nozzles.

**Horseshoe Nail Plate**: manufactured by the Kinsley Iron & Machine Company of Canton, Mass., from iron, same as duty paid. Add 5 per cent. to the exported weight to cover wastage in manufacture.

**Hungarian Nails**: manufactured from steel plate scraps or boiler shearings, same as duty paid. Add 10 per cent. to net weight exported article.

**Hungarian Steel Nails**: manufactured by E. Phillips & Sons of South Hanover, Mass., wholly from imported boiler steel shearings or steel plate scraps, same as duty paid. Add to net weight of the exported nails 7½ per cent.

**Iron bolts and nails**: manufactured by the Diamond State Iron Company of Wilmington, Del., wholly from imported old iron rails, same as duty paid. Add to the net weight of exported articles 19 per cent.

**Iron**, band, bar, horseshoe, hoop, railroad, rod, scroll, wholly from imported scrap iron, same as duty paid. To cover wastage in manufacture add 25 per cent. to exported weight when exclusively old scrap iron was used and 12 per cent. only if part of the material was new scrap iron.

**Iron Rivets**: manufactured by Diamond State Iron Company, Wilmington, Del., from wire rods, same as duty paid. Add 5 per cent. net weight.

**Lithographic Tin Plates**: Manufactured by S. A. Ilsley & Co. of Brooklyn, N. Y., from imported tin plates, same as duty paid. Deduct from net weight exported articles 4.6 per cent. of such weight.

**Locomotive Tires**, from imported steel, same as duty paid. Add 2 per cent. to exported weight to cover wastage in manufacture.

**Locomotive and Railroad Car Wheels**: On the exportation of locomotive and railroad car wheels, made wholly or in part from imported tires and centers, and exported as parts of locomotives or cars, or exported separately, a drawback will be allowed equal in amount to the duties paid on the imported materials used in the manufacture of such wheels, less the legal deduction of 1 per cent.

The entry under which such wheels are to be inspected and laden must show separately the kinds of wheels, the dimensions of the same, and the dimensions and weights of the several parts on which drawback allowance must be based. The dimensions of tires given must include inside diameter with one inside face and thickness on "tread," and the given dimensions of centers must include outside diameter of rim, width of rim on face, and diameter and length of axle bore. The entry must be accompanied by drawings of the wheels and parts, or refer to such drawings on file with the collector of the port from which exportation is to be made, illustrating the description given in such entry, by showing the measurements of the wheels and parts, which descriptions and measurements shall be verified by the inspecting officers. When practicable, the weights given in entry of the several parts of the wheels shall be verified by a United States weigher.

The manufacturer's declaration on the drawback entry must show, separately, the kinds, dimensions and weights of the imported materials used in the manufacture of the wheels, describing the material for each part of the finished wheel as the same was described in the invoice under which it was imported and in the drawing accompanying such invoice, or referred to therein. Such declarations shall also show, separately, the quantities and values of the different kinds of resultant scrap or "waste" and the values at the factory of the respective kinds of imported material from which such "waste" is produced.

In determining the weight of imported material which shall be made the basis of allowance of drawback on the finished article, the weight of the material in condition as imported shall be reduced by a number of pounds equal in value to the value of the "waste" resulting from manufacture, according to values of material and waste shown in the manufacturer's declaration.

**Low Tin Screw Tops**: Manufactured by the Devos Mfg. Company, New York, imported tin plate and attached to 5-gallon tin cans, same as duty paid. Allow 2 pounds tin plate for every 100 completed screw tops.

**Nail Rods** rolled from iron, same as duty paid. Add 9 per cent. to the exported weight to cover wastage in manufacture.

**Nail Rods slit** from iron, same as duty

paid. Add 3 per cent. to the exported weight to cover wastage in manufacture.

**Nails cut from scrap iron**, same as duty paid. To cover wastage in manufacture, add 25 per cent. to exported weight when exclusively old scrap iron was used, and 12 per cent. only if part of the material was new scrap iron.

**Nails, horseshoe**, from iron rods or bars, same as duty paid. Add 14 per cent. to exported weight to cover wastage in manufacture.

**Nails, horseshoe**, from slit iron rods, same as duty paid.

**Nails, horseshoe**, from steel (Martin-Siemens process), same as duty paid. Add 14 per cent. to net weight.

**Nails, Hungarian, tinned**, same as duty paid. Allow for tin 3 per cent. and for iron 97 per cent. of weight of nails, and add to quantity of iron 14 per cent.

**Nails or Tacks, trunk**: manufactured by E. Phillips & Sons, from iron, same as duty paid. Add 6 per cent. to net weight.

**Nails, shoe**, from zinc, same as duty paid. Add to exported weight 7½ per cent. to cover wastage in manufacture.

**Nails, shoe**, manufactured by Dunbar, Hobart & Whidden of South Abington, Mass., from iron, same as duty paid. Add 9 per cent. to exported weight to cover wastage in manufacture.

**Nails and Tacks**: Manufactured wholly from scrap steel or boiler plate shearing, same as duty paid. Add to net weight for Hungarian nails 13 per cent.; for cut and carpet tacks and shoe nails, 12 per cent.; shoe tacks, 13½ per cent.

**Nails and Tacks**: Manufactured from boiler plate shearings by W. W. Cross of Brockton, Mass. and the Atlas Tack Corporation of Boston, Mass., same as duty paid. Add 7 per cent. to net weight.

**Needles**, sewing machine, from steel wire, same as duty paid. To cover wastage in manufacture, add 5 per cent. for needles made by the drawing process, and 33 per cent. for those made by the milling process.

**Nestable Dinner Pails**: Manufactured by F. G. O. Ehle & Co. of Buffalo, N. Y., from imported tin plate, same as duty paid. Deduct from gross weight 15 per cent.

### The Morton Tin Plate Company.

About the middle of last June a party of gentlemen met at Cambridge, Ohio, and discussed the advisability of building a tin mill. It was decided to take chances in regard to tariff legislation and commence the erection of a plant. The company was named the Morton Tin Plate Company, as the site selected was on the Morton estate. On July 5 articles of incorporation were issued, and the following officers were elected: John W. Marquand, president; Chas. L. Campbell, vice-president and treasurer; John C. Beckett, secretary; A. Beard, Jr., general manager, and John C. Morton, director. About 75 acres of the Morton estate were purchased, and 220 lots were laid out in the part of it known as the Cambridge Fair Grounds. These lots were sold to the people of Cambridge at a common price of \$120 each. After five monthly payments had been made the lots were distributed and the arrangement gave general satisfaction. The tin mill company receive a handsome profit on the undertaking, and the lots are deeded to a trustee until all parties to the agreement have filled their contract.

The location is at the junction of the Cleveland & Marietta Railroad and the Baltimore & Ohio, each road having tracks on either side of the building, which is elevated to the level of the floors of cars.

The building of this plant presents a remarkable illustration of what can be done with push and energy. Ground was broken on August 20, and the work has been accomplished by a body of workmen who were, with one exception, inexperienced in the work performed. Notwithstanding this fact the result has

given perfect satisfaction to the projectors, and the plant is modern in every particular. Every piece of machinery and all other material is new, nothing second hand being used.

The plant consists of three hot mills for black plates driven direct by a Hamilton Corliss engine 32 x 60 inches. Also three stands of cold rolls, with foundations already laid to double this capacity, which is now 2000 boxes per week. All the machinery is placed under one large building 200 x 130 feet, and the only outbuilding is a blacksmith and carpenter shop combined.

The building, constructed of iron and steel, was furnished by the Wrought Iron Bridge Company, Canton, Ohio.

Two engines, one 32 x 60 inches and one 24 x 48 inches, were furnished by the Hooven, Owens & Renstschler Company, Hamilton, Ohio.

The boilers (return tubular) were built by the Erie City Iron Works, Erie, Pa. The Leechburg Foundry & Machine Works, Pittsburgh, Pa., furnished three stands of hot rolls 24 x 32 inches, and three stands of cold rolls 20 x 32 inches, three doubling shears, two vertical trimming shears, one roll lathe and one Mesta patent pickling machine; 650,000 brick were used in the foundations and boiler settings.

If nothing interferes some trial heats of black plates will be rolled about December 17, and every detail of the construction will be completed six months from the time when the projectors held their first meeting. The plant was designed by and erected under the personal supervision of A. Beard, Jr., General Manager. The company will shortly commence to build a tinning house.

#### Some Suggestions for Engineers' Specifications.

Some recent experiences prompt us in making two suggestions which should be specially considered by engineers, as well as by boiler makers.

We have yet to see a specification for boilers, stand pipes or kindred work where the physical requirements varied with the different thicknesses used. This is most notable in stand pipes or tanks which begin at the base with thick plates and decrease, course by course, as the top is reached. For example, on a large stand pipe which we recently furnished, the lower course is  $\frac{1}{4}$  inch thick, and gradually lessens to  $\frac{1}{8}$  inch at the top. And yet the same physical qualities were named for the entire order. No mill can, of course, furnish such an order without making a separate lot of steel for each thickness of plate used, nor is this at all necessary. The remedy is for engineers to make their requirements apply to one particular thickness which may be regarded as standard, and a certificate be obtained, if necessary, from the manufacturer stating that the balance of the material used was from the same heat. Or, if tests on the balance are desired, there should be a fixed allowance for variation of tensile strength, elongation, &c., where the plates are thicker or thinner than the standard thickness.

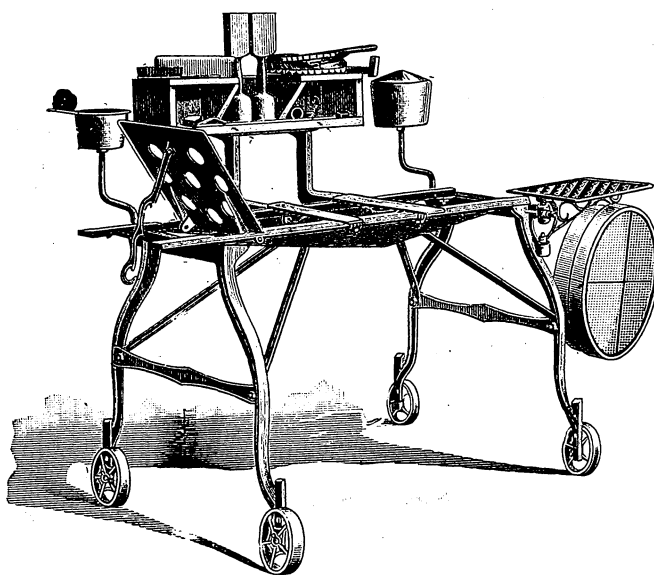
Another suggestion which the collapsed stand pipe at Peoria, Ill., brings to mind, is the advisability of reaming out all punched rivet holes in heavy material, especially in the lower grades of tank and cheap flange or shell steel. By heavy, we mean  $\frac{1}{2}$  inch and thicker, and in some instances it would be well to treat  $\frac{3}{8}$  inch the same. We can imagine a thick plate of steel made up

of layers like a block of paper. One or several of these sheets can be penetrated close to the edge without tearing the material. But an effort to force an instrument through the entire mass would puncture or break out the edges. So with steel plate, a long used or dull punch strains the steel in the rivet hole, more in a thick plate, less in a thin one. This strain tortures the material, which, under a magnifying glass, is shown by little veins or fractures radiating out from the rivet holes. By reaming out the metal, say  $\frac{1}{16}$  inch, this injured metal would be removed, and the tendency to fracture destroyed. The United States Government allows 20 per cent. more pressure on marine boilers where the rivet holes are drilled, than if punched. The additional cost of reaming punched holes is a trifle compared with the removal of an element of risk inseparable where punched sheets are used. There is no shop so small but it has a drill press, so permitting this operation without inconvenience. The best boiler makers and engineers do not

handle all their coal with one man, at a considerable saving in expense and trouble. The Link Belt Engineering Company are putting in this track in their New York store to handle in and out of the store the goods they carry in stock, which are heavy and required several men to manage. Into Appleton's large book bindery some track is to be put in to carry large electrotypes plates from one department to another. The overhead track is inexpensive, is out of the way and occupies space in a store or factory which cannot be used for any other purpose. Once put up it costs little to maintain or keep in order, is always ready for service, and the heaviest goods can be moved about on it, raised or lowered into place by a single person without difficulty.

#### Rowland's Movable Molders' Bench.

The molders' movable bench here illustrated is introduced by the S. Ober-



ROWLAND'S MOVABLE MOLDERS' BENCH.

deem reaming necessary on light plates—i. e.  $\frac{1}{8}$  inch thick and less.—*The Boiler Maker.*

The Cameron Tracking Company of Brooklyn have been recently formed to manufacture overhead tramway or tracking for factories, warehouses, boiler rooms, and where heavy goods or merchandise of any description have to be moved about. It is a new method of handling goods and is more economical than handling goods on the floor. As an instance of the variety of uses it is put to it is stated that the large factory of the Robinson Stoneware Company in Brooklyn, manufacturers of soap stone wash tubs, has been equipped. They formerly employed several men simply to store away tubs after they were made. Now they handle them entirely from overhead track, one man pushing them on the track to the storehouse when finished and from the storehouse when being delivered. They save expenses of several men. The Museum of Natural History, Central Park, where a large quantity of coal is used, formerly carried the coal to the boilers in barrows, seven men being required to pass the coal. They have put in a system of overhead track at a small expense which will enable them to

mayer Company of Cincinnati, Ohio. With its aid the molder need not carry heavy molds back and forth, inasmuch as he requires only enough floor room to perform his labor, and, after pouring his work, he need not lift it more than to simply dump it where it lies, on the floor. It is claimed that more and heavier work can be handled on and from this bench than from one that is stationary. The bench is constructed entirely of iron except the tool box, which is made of wood. It is sufficiently large to allow the molder ample room to work and yet is so arranged as to be very convenient. The tool box, sponge pot and parting sand pot are so adjusted that the molder can have them as near to him as he desires. The tilting shelf on the left of the bench is so arranged that he can lay his cope down with ease. The swing shelf on the right may be utilized to lay matches and patterns on. The bench may be raised or lowered, for the convenience of short or tall molders, it being adjustable from 2 feet 8 inches to 3 feet in height.

A highly interesting report has been just issued by Charles M. Jacobs, chief engineer of the East River Gas Company, on the construction of the tunnel under the East River. It is a clear



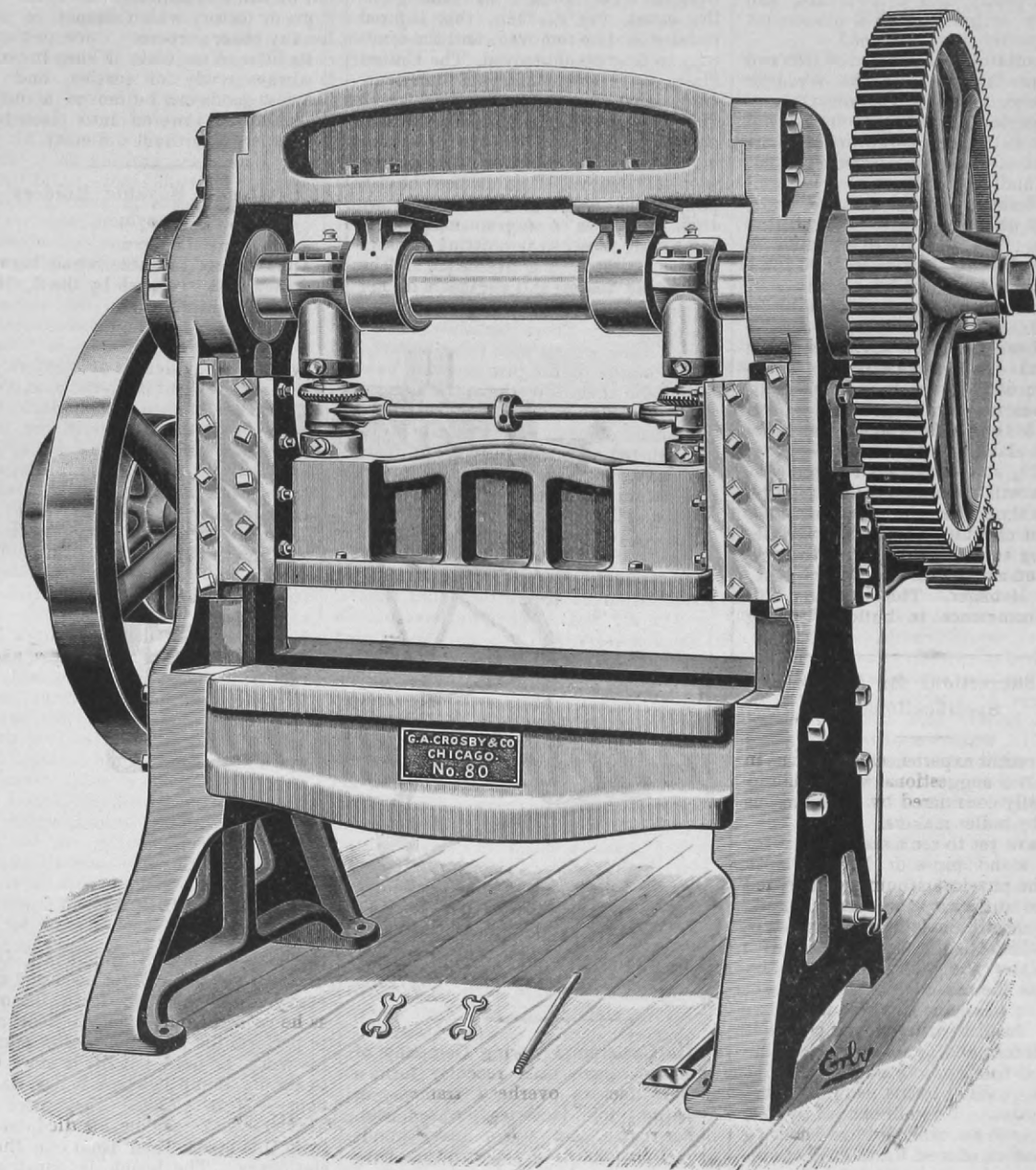
narrative of the difficulties and perplexities which attended the progress of the work, growing out of the fact that several beds of decomposed rock and seams of slimy material were met with. The hydraulic shield was employed and very high air pressures were necessary to carry through the work of excavation. The maximum reached was 48 pounds per square inch. These exceptional air pressures led to four deaths. The

mining products; 0.49 products of the fisheries, and 0.52 per cent. of the exports were miscellaneous commodities.

### The Crosby Power Press.

A new back geared, straight lined power press adapted for cutting out large articles in tin, brass, copper, sheet

head when operating dies which are constructed with powerful steel or rubber springs under the lower die. Unless overcome or balanced in some manner, the cross head, after being released from the pressure of the downward stroke, would be driven up so forcibly as to oftentimes break or derange the mechanism of the clutch, or, carrying it past the highest point before the clutch had caught on, allow it to descend



THE CROSBY POWER PRESS.

earliest injurious effect in a healthy subject is itching caused by air globes in the capillaries. Then follow "bends," an intense rheumatic pain in the joints caused by air globules in the sockets, and lastly paralysis, which leaves lasting injury, and usually is the cause of death when such occurs.

Secretary J. Sterling Morton of the Department of Agriculture, in his annual report for the fiscal year ended June 30, 1894, shows that of the total exports from the United States in that period, 72.28 per cent. were farm produce; 21.14 per cent. were manufactures; 3.22 were forest products; 2.35

iron, steel, &c., has been brought out by G. A. Crosby & Co. of Chicago. The shaft is made of steel and has journals each side of the crank to prevent springing. The gears are all cut and have broad and large teeth. The cross head runs in V-bearings, which are made adjustable for wear. The pitmans are made with broad bearing surfaces and are adjusted by means of a cross shaft, which is provided with a gear and pinion at each end that are closely fitted, so there is no back lash. This permits of adjusting both pitmans exactly alike. The press is provided with an automatic brake designed to prevent the sudden reverse motion, which would otherwise be communicated to the cross

again by its own weight, making accidents much more liable to occur. This brake acts only at the time required to prevent a sudden acceleration in the motion of the cross head—that is, from the time the punch and cross head start upward until the punch leaves the drawing ring, which is usually about one-quarter of a revolution of the shaft, thus leaving about three quarters of the revolution of the shaft open or free from friction or use of power. The press is so arranged that it may be taken apart to facilitate transportation, handling and setting up. The main dimensions of the press, which is built by G. A. Crosby & Co. of Chicago, are: Opening in bed

(varied as desired), 20 x 43 inches; distance between uprights, 53 inches; distance from bed to bottom of slide, when latter is up, 9½ inches; motion of slide (as desired), 3 inches; adjustment of slide, 4 inches; weight complete, about 18,500 pounds.

### Losses in Boiler Practice and Some of Their Causes \*

BY DANIEL ASHWORTH, PITTSBURGH.

It seems but a brief period since the highest authorities in steam and power literature made the statement that, "Covering a period of about a quarter of a century, the advance in the development of the steam engine, in its many forms and types, was marvelous and far beyond the expectations of the most impatient and exacting, and is still continuing; but, as a startling anomaly to this condition, very little, if anything, has been done toward an advance in the boiler and boiler room during that period."

Following very closely, indeed, right upon the heels of this declaration, the movement toward reform in this direction set in, resulting, at the present time, in the production of a multitude of steam boilers of various forms, all claiming, and many sustaining, a commendable advance in economy, safety and durability. The development of boilers together with furnaces and devices, all converging to a more thorough combustion and rapid steam generation, would certainly lead one to believe that a radical improvement in the way of economy of fuel would result. While, in a measure, in special cases and conditions, there has been somewhat of an encouragement, yet a careful review constrains us to believe that the results are far short of what would be expected, and this is demonstrated, not only by careful and elaborate tests, but, in addition, by close observations of regular continuous operation. This cannot be attributed to the unworthiness of the modern boilers and appliances, for a large number possess many features and requirements to give favorable results, and exhibit, on the part of the designers, a knowledge and research in the principles for generating steam which exhibit commendable ingenuity and skill. Now, the question which presents itself to us so forcibly is: Why, in the face of all these favorable movements, does the boiler department fail to keep pace in its results with the thoughts and productions of boiler, furnace and stoker builders?

Observations of a number of boiler rooms applied to a variety of purposes enable us to note that it is the aggregate of the small losses that so greatly neutralizes and sets at naught the best efforts in this direction. It is no uncommon thing to come in contact with a steam plant of modern equipment where cracked furnace walls are presented at numerous points, permitting a large amount of cold air to enter, thus entailing a loss of a most wasteful character. In the return tubular boilers, we are confronted with the gross indifference shown in many places by the fouling of tubes. The amount of deposit of carbon or soot that is frequently permitted to accumulate would scarcely be believed when it is so well known that this deposit is one of the

greatest non-conductors of heat, and hence another entailer of loss. In the water tube boilers we have the same trouble, but in a different way, viz.: The gross neglect in not keeping the tubes clear of scale and other deposit, many cases being presented where the tubes are almost completely obstructed. Even what is looked upon as comparatively light scale is well known to be greatly detrimental to boiler efficiency.

Again, we have in the majority of steam plants a lack of capacity. In some cases this is the result of guess work or lack of knowledge as to the amount of steam required for the work in view. Occasionally it is a result of mistaken economy in first cost, and frequently where additional work has been added to an establishment without a corresponding increase in the boiler plant. How often do we hear this query: "Why am I short of steam?" These boilers, five years ago, operated this establishment without a bit of trouble and with perfect ease, and now we can scarcely operate without a source of annoyance, caused by dragging along, &c. There certainly must be something wrong with these boilers, for they ought to do just as well now as they did then. We have tried all manner of engineers and we have tried all qualities of coal, and we seem to have exhausted all our resources, and instead of matters improving, the trouble has been increasing all the while." After some reflection, we very quietly ask, "Have you made any changes in your plant as regards work done, or to put it more plainly, have you increased your establishment any within that time?" "Oh, my, yes! Why, we have put on another story, and we have built that wing out there since then." And, being conducted through the establishment, we are shown, with considerable pride, where a large fan had been put in, and a pulverizing machine, and a large boring machine. Then we are taken into another department and shown where they have added an electric light plant, and in addition to this they have a series of steam blasts or baths where electro-plating and such work is done, where live steam is called into requisition very often and in considerable quantities. Besides that they have, in keeping with the age in which they live, added a couple of electric motors for driving electric cranes, and put in a couple of elevators, and so on. And there seems to be a somewhat thoughtful expression upon the features when we ask, "Has it ever occurred to you that, with all these additions and this gratifying progress, you have done nothing toward increasing your boiler power? We venture to say that if you were to remove all these additions that you have made in the period you speak of, setting aside the usual wear and tear, these boilers would perform their functions just as easily as they did when they were first placed." This source, the overtaxing boiler capacity, is so easily overlooked that the number of cases is somewhat startling. This undue urging of boilers, produced by causes enumerated, always has its accompaniment of rapid wear and tear, destruction of the furnaces, high stack temperature of escaping gases, in which the heat units are rapidly forced up the stack, or, in brief, a waste of fuel beyond comprehension.

In power plants connected with city buildings we are confronted on almost every hand with the utter lack of space and with the absence of every condition that would be conducive to attain-

ing anything approaching proper results. This crying evil is brought about either by lack of appreciation of the importance of the steam plant as to results, or total indifference upon the part of those who have the designing and planning of the buildings. The prevailing idea seems to be to concentrate upon proper proportions in all parts connected with the building, and at the very last moment to conceive the idea that any hole or place that is left is good enough for the engineering department. From this standpoint we have boilers placed in the most inaccessible places, wretchedly cramped, with tortuous flues to reach what is known as the stacks for the boiler, which are, in many buildings simply flues with capacity sufficient for the ordinary grates in an office. No provision is made for ventilation—in fact, nothing that tends to give the least efficiency. And these are not by any means in shabby buildings or obscure places, but are very frequently met in the most prominent and otherwise well appointed buildings. The writer has frequently been escorted through buildings and the various departments and all their accessories shown with a spirit of pride, there being on every hand evidences of comfort, taste, refinement, light in abundance, ventilation in accordance with modern practice—in fact, all that could be desired by the most fastidious as appropriate to the class of buildings. In the face of this, when reaching the engine department and boiler room, it seems but a step "from the sublime to the ridiculous." And under such conditions is it any wonder that those in charge of such department should, in a short while, no matter how tasty they may have been before, naturally beget a slouchiness and lack of personal taste which would be in keeping with the department in which they are operating? Mechanically, how could it be expected that the boilers and furnaces could be kept in anything like proper order when every point is of such difficult access? The cleanings and inspections, which should take place frequently, are continually deferred until it becomes a compulsory matter, and when done is far from being well done. With bad flues in these city buildings, lack of room for proper blow-off connections, improperly constructed furnaces, where furnaces are made to suit the room, is it any wonder that we have great volumes of dense black smoke annoying the community, or that we have such poor results in generating steam in city buildings? Happily, we are encouraged in the belief that this is passing away. It will, however, linger with us until that time shall come when the architect relinquishes the idea that he knows all about steam plants and engineering, on the same basis that our barber, in our early days, would bleed, blister, and extract a tooth along with the practice of the tonsorial art.

The revival of mechanical stokers, which had been lying dormant on the other side of the ocean for a number of years, resulted in the development of a number of machines, each possessing its respective merits, not only with the machine itself, but in the type of furnaces that formed a part of the same. But, taken as a whole, the expectations of the most earnest advocates of these machines have not been realized, and the inherent weakness or defect which presents itself in the greater number of these machines is the large amount of incandescent fuel that is dropped into the ash pit during the process of dump-

\* From a paper read before the Engineers' Society of Western Pennsylvania, November 16

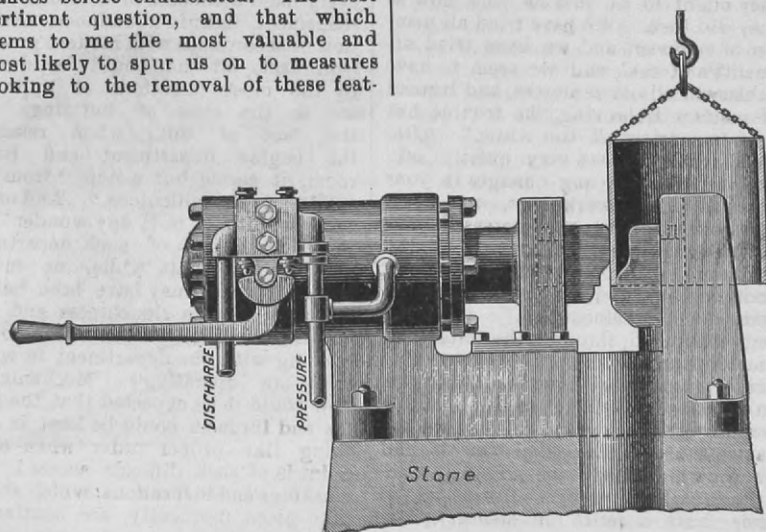


ing the bars, which is necessarily done at frequent intervals. This entails, not only a loss of the very best fuel in the condition to produce the best results, but it also wastes, in this critical operation, a large volume of heat that should be retained and distributed to do effective work. The most earnest advocate of mechanical stokers recognizes this, and it has become a matter of serious thought in considering this loss whether we were really better off than with first-class hand firing or with a shaking grate. That there is room for a radical improvement in this direction is beyond all question. Success in dispensing with the dumping process, carrying with it great masses of rich fuel, would be heartily appreciated by those who are nearest advocates of the stoking principles.

It seems to me that the question frequently asked, "How much do we lose in boiler efficiency under average conditions?" would almost equal the question, "How large is a lump of chalk?" At any rate, we certainly know that we do have losses that are immeasurable under the faulty conditions and circumstances before enumerated. The most pertinent question, and that which seems to me the most valuable and most likely to spur us on to measures looking to the removal of these feat-

other conditions. A judicious selection of men in charge of boilers, who have a fair share of intelligence and are recognized as having such, will do much more to form an incentive to grasp the idea that the attention to these seemingly small details will produce more desirable results. Besides shoveling coal, carrying water—and, by the way, in nine cases out of ten this feature is not properly done—there should be a system of cleaning tubes, internally and externally. Thorough vigilance upon the walls of the boiler, attention to the matter of draft and proper distribution of the fires would certainly bring about a higher degree of efficiency and economy.

In addition to these advances in the grade of firemen there must be a more liberal idea as to the capacity required in steam boilers to do their work. For, as we have pointed out before, with the best of firemen and all other conditions an overdriven boiler plant cannot under any circumstances be worked economically.



THE WOOD HYDRAULIC FLANGING MACHINE.

ures that are so detrimental is, "How can we remove this existing state of affairs?" And then, when these are removed, it would be eminently proper to consider the finer and more technical points which would be required to sustain still further advances.

One of the prominent features—and it seems to me to be the key of the whole situation, and which the writer has for some time incessantly talked and hammered upon—is that, in the first place, the superintendent of the boiler or the power department should recognize that the boiler room is the threshold of economy and efficiency, and whatever losses are sustained here by any means are irrevocable in the future stages of the power operation. It would seem that at this stage the losses must easily occur, and at the same time it cannot be denied that, with proper interest in the management of the various details, they are just as easily prevented. I trust that the time is rapidly passing away when the superintendent will look upon the fire room as simply a place to shovel the coal under the boilers, pump in the water and remove the refuse from under the grate bars. The indispensable thing on the part of the superintendents is to recognize the fact that ordinary muscular work without brains is not sufficient to produce the results which can be obtained under

In city buildings, especially, where space is necessarily limited and frequently unavoidably so, closer attention should be given to space and accessibility in the boiler department to the various points connected therewith. Many a connection has been allowed to waste for an unreasonable period of time. Many destructive corrosions have taken place by continued leaks and droppings by reason of the difficulty and great inconvenience of access to reach these points, which would have been entirely prevented by giving a little more room, which, in itself, would have begotten a promptness of action to have prevented all this.

There has been a line of argument adduced in opposition to these views—that we would have to pay higher wages in order to have more intelligence in these departments. Conversely stated, then, it would be more profitable to have ignorance and its attendant waste surrounding us on every hand. If proprietors and progressive superintendents are willing, and I believe they all are, in general, to adopt mechanical devices when it is clearly demonstrated to them that their operation is such as to be conducive to economy, when they cheerfully place upon their plants automatic dampers, shaking grates, water alarms and such appliances, does it not seem to be a gross inconsistency that

they halt or hesitate at least upon the question of a little investment for more brains and intelligence? And does it not seem to be a still greater incongruity that when all these appliances, no matter how excellent they are, from the gauge cock to the complete stoker, can be rendered almost useless as far as economy is concerned, and indeed very frequently far more wasteful when improperly used than when in their primitive condition? It is a well-known fact, and I think every inventor will bear me out in this, that the very best appliances, which would have become almost universally adopted, have been eternally damned by being left to the entire control and indifference of an ignorant operator.

When these plain and unvarnished facts are recognized by interested parties, then we will make rapid strides in economy, which I believe will far exceed the expectations of the most sanguine. When we have arrived at that stage we shall feel somewhat emboldened and encouraged, if you please, to talk with some degree of confidence that we shall produce some results upon the chemistry of combustion and circulation and calorimetry, and with some feeling of assurance that these, in addition to what has already been accomplished, if it will not make us feel that we have arrived at a condition of *ultima Thule*, we shall have accomplished a revolution which will form an important epoch in the history of steam making.

If the plain facts, as herein expressed, will—either through the medium of discussions, exchange of thought or otherwise—set the wheels of thought into motion in this direction, which ultimately will produce a reformation in boiler departments for which we so earnestly plead, we will have the satisfaction of knowing that, no matter how crude the efforts may be, they have not been in vain.

#### The Wood Hydraulic Flanging Machine.

The engraving represents a small hydraulic flanging machine, designed and built by Wm. H. Wood of Media, Pa., for flanging ogees on boiler shells after they have been rolled. The machine is arranged so that it will also put ogees on the two sides of a shell after it has been rolled, as well as at the top and bottom of the circle. It is also applicable for flanging the enlarged parts of the shells joining up to the fire boxes of horizontal portable boilers. It can also be used for flanging water bottoms for portable boilers, and, in addition, it can be used for upsetting bolt ends and bending angle iron rings and for doing structural work. It is stated that one of these machines has been at work doing the flanging as described on some boilers, and it has done the flanging on about 1000 boilers since it was put it. It is worked from an accumulator pressure, and the formers or dies are made to fit in the head and post in a simple manner, and any desired former can be put in the machine in a few minutes.

It is said that the Reading Coal & Iron Company have 1,000,000 tons of unsold coal on hand.

The Bank of England was relieved of the burden of the remaining assets and liabilities of Baring Bros. & Co. last week, which have been taken over in full by the Barings and their friends.

### Transfer of the Crane Business by the Yale & Towne Mfg. Company.

The Yale & Towne Mfg. Company of Stamford, Conn., announce that they have sold to the Brown Hoisting & Conveying Machine Company of Cleveland, Ohio, the business of their crane department, comprising the designing and building of traveling, locomotive, jib, pillar and other cranes. This transfer includes all of the drawings, records and patterns relating to the crane business heretofore conducted by them, thus placing the purchasers in position promptly to attend to all orders for the repair or duplication of work previously executed by them. The change took effect on December 1.

The step taken by the Yale & Towne Mfg. Company is of much significance in some respects. *The Iron Age* has obtained an official statement of the development of this part of the business and of the motives which led to its transfer.

Some 17 or 18 years since Henry R. Towne was led to appreciate the fact, partly through observations abroad, that this country was far behind in the use of cranes. As manufacturers of the Weston pulley blocks and of hand hoisting machinery the Yale & Towne Mfg. Company were deeply interested in the subject and naturally undertook the making of the new product at Stamford, Conn., where their large works were located.

At first the cranes called for were small, never exceeding 10 tons capacity, and more frequently of 5 tons and under. A few were made for operation by power, but most of them were hand machines. The business soon began to grow, however, both in volume and in size of cranes called for. In 1881 a shop was built expressly for crane work, but the growth of the business was so rapid that in 1883 it again became necessary to build and on a much larger scale. At times even the later buildings provided for this work have been overtaxed, but numerous competitors having entered the field, the growth of the business was naturally distributed among them, with the effect of checking the exceptionally rapid rate of increase which previously obtained at Stamford. Nevertheless, the facilities of the crane department became inadequate to the business, the growth of which prior to the recent panic had forced upon the company the consideration of providing other and better facilities if the business was to be continued.

In the mean time, however, the business had greatly changed. While a moderate demand still exists for hand and power cranes of the smaller sizes, by far the greater part of the business now consists in the building of electric traveling cranes and steam locomotive cranes of large dimensions and capacities, involving the use of large amounts of structural material and making the question of transportation a serious factor. The principal works are located at Western points. The Yale & Towne Mfg. Company had to obtain most of the heavy material from Pittsburgh or other Western points, and the largest market for cranes now exists west of the Alleghany Mountains. Under these conditions Stamford had obviously become an unfavorable point of manufacture for this work, and it therefore became imperative to consider the question of transferring it to a better location. A careful investigation was made, which led to the conclusion

that Cleveland, Pittsburgh or their vicinity offered the maximum advantages, and negotiations were begun last spring looking to the transfer and re-establishment of the crane business at one of these points. In the course of these negotiations the Yale & Towne Mfg. Company were brought into communication with the Brown Hoisting & Conveying Machine Company, already having extensive works in Cleveland admirably suited to crane building, and already engaged in work of closely similar character. The outcome of the discussion thus started was a proposition from the Cleveland company to purchase the crane business of the Stamford concern.

Simultaneously with the above occurrences was a rapid and large increase in the volume of the business of the Yale & Towne Mfg. Company in their older and principal lines relating chiefly to builders' hardware. This had made necessary several recent additions to the plant, and had led to the point where still further additions are needed. The buildings heretofore occupied by the crane department had become surrounded by those made necessary by the growth of the hardware departments and were blocking the way to the best and most convenient extension of the latter. The transfer of the crane business elsewhere solves all of these difficulties and enables the Yale & Towne Mfg. Company at once to make the needed extension of the hardware departments in the best possible manner.

A further important reason leading to the decision made was the fact that the crane business, comprising a line of heavy machine products and an engineering organization, was wholly unrelated to the other older and larger lines, both in the producing and commercial departments, thus involving a distinct organization both for manufacture and selling. By disposing of the crane business it is possible to concentrate the management and the future growth entirely upon the original lines, which, with a few slight exceptions, all relate to builders' hardware.

Originally the hardware products comprised only the Yale locks and a very limited line of hardware, all of special and expensive character. Subsequently, however, the original lines were expanded so that the series of Yale locks was made so extensive as to adapt them practically to every purpose to which good locks are needed, and a distinctly new field of work was developed in the manufacture of artistic metal work for use on doors, windows and for all interior purposes, the creation of which has revolutionized architectural practice in this respect.

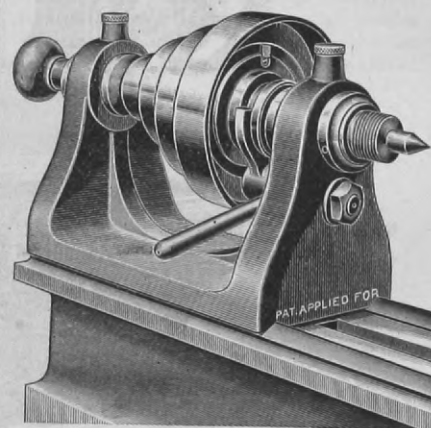
More recently, in 1891, there was added a new department, devoted exclusively to the manufacture of cabinet locks in almost endless variety, and in 1894 the company acquired possession of the Branford Lock Works, where they now manufacture a complete line of locks and builders' hardware of popular and less expensive character than the Stamford product. These facts are sufficient both to explain and to justify the decision of the Yale & Towne Mfg. Company hereafter to concentrate their energies and growth upon builders' hardware and allied products. The sale of the crane business, which has just been effected, is merely one step, although an important one, in the consummation of the plans and policy decided upon many months ago.

The sale of the crane business includes crane work of all kinds, crabs,

winches and tram rails. The long established business of the Yale & Towne Mfg. Company in chain pulley blocks, including Weston's Differential block, Weston's Triplex spur gear block and the new Duplex screw block, as well as the line of double lift hoists, will be continued as heretofore.

### The Rhodes Hand Lathe.

The L. E. Rhodes Company of Hartford, Conn., are introducing a 12-inch hand lathe having some novel features. It is provided with a combination friction clutch and brake by means of which the spindle may be started or stopped instantly, while the cone pulley is continuously revolving. The power is thrown off only when the machine is not in use. A lever in the head block is arranged to operate, by means of a very coarse threaded screw, a hub keyed to and sliding laterally on the spindle. When the hub is moved in one direction, a friction clutch of the ordinary type placed within the cone pulley is engaged and the spindle thereby revolved; when the hub is



The Rhodes Hand Lathe.

moved in the opposite direction the clutch is released and the brake brought into action.

In work requiring high speed and where frequent changes or stops are necessary, the workman is often obliged to waste as much time while the machine is slowing down as to change the work for the next operation, and by the use of this combination brake and clutch this waste is largely avoided.

This lathe, if desired, is furnished with the Rivett No. 4 chuck, made by the Faneuil Watch Tool Company, and with a compound rest with adjustable stop.

Work has been started at the yards of the Pusey & Jones Company, Wilmington, Del., on a fine steel steam yacht, from designs by Henry Gillon, to the order of a well-known New York yachtsman. Swiftmess is to be one of the essentials of the yacht, which will measure 140 feet in length over all and 115 feet at water line, 17 feet beam and 6½ feet draft. A novel feature as regards yachts will be a double bottom, the space between the two being utilized for fresh water tanks. The engines will be of the triple expansion type, with four cylinders, and will be of 600 horse-power. Steam will be furnished by a patent tubular boiler. The guaranteed speed of the boat is 20 knots an hour, and with natural draft she is expected to accomplish 18 knots. The



saloons, staterooms and internal fittings in general are to be equipped with the greatest elegance, and, throughout, the yacht is to be the embodiment of the newest ideas in building. The yacht building industry generally is reported to be in exceedingly good shape, after a considerable period of depression.

### Tin Pack Shear.

The accompanying illustration is of a new tin pack and trimming shear, built by the Wais & Roos Punch and Shear Company of Cincinnati, Ohio, for the especial purpose of cutting packs and trimming sheets in tin mills. The machine is built with or without engine and with or without gearing, the cut showing it with both engine and gearing. It is supplied with front, back and side gauges. The standard length of blades

which has been formed merely with the object of gaining an extension of the concession.

### San Francisco News.

The Oakland Iron Works, recently almost completely burned out, are being fast rebuilt and that in a much more solid and substantial manner than ever before. There will be many additional facilities, and not only that but the new establishment will be able to do work much more cheaply than before. Every department has been got into working order. There was not a day lost on account of the fire, and orders have been pouring in on them. This shows what can be done by those who are in earnest and who are possessed of the requisite energy even under the most adverse circumstances. And herein

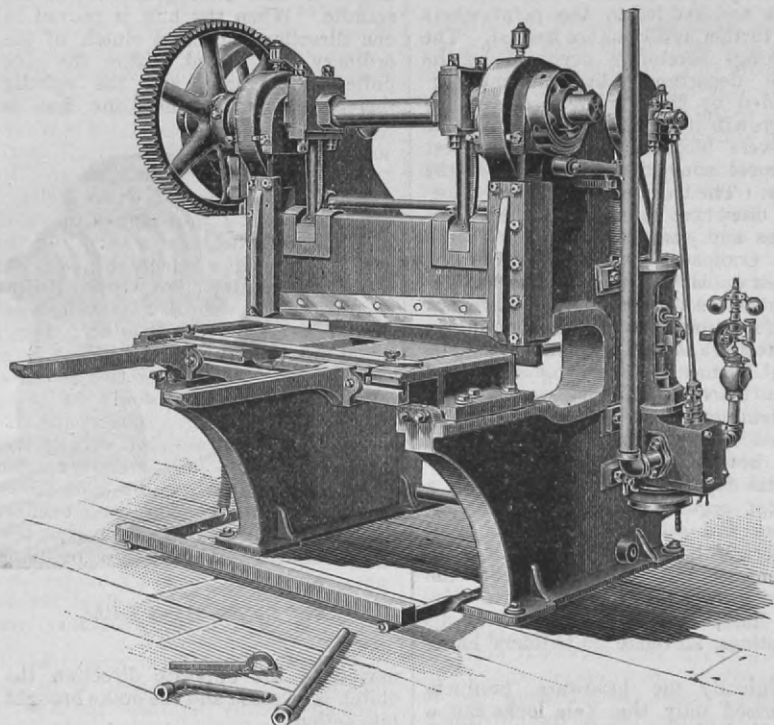
they have been. It does not, therefore, need the indications afforded by the Clearing House exchanges to tell that, compared with the latter part of 1893, we are, if not exactly prosperous, at least in a fair way to become so. The feeling that this is the case will work wonderfully toward recuperating some of our dormant energies and arousing our capitalists from their sleep.

We had a mining convention here the other day, which was attended by some of the leading men in our iron industries. There has been considerable of a revival of our gold mining industry during the past year, and a renewed demand for machinery both of Eastern and California make is expected. California—that is, San Francisco—should have the inside track. Times never were so prosperous as when the mines were in full swing, this State producing from \$23,000,000 to \$25,000,000 in gold per annum, and the Comstock pouring its wealth of both gold and silver into the lap of San Francisco. Then our foundries used up every year for quite a while close on 20,000 tons of pig iron, not to speak of the scrap that was utilized. Then Oregon's iron industry promised well, as also did that of California, but now the pig iron business of California has, with the exception of some spasmodic efforts, long been a tradition, while the importations of scrap, which have gone as high as 27,000 to 28,000 tons a year, have dwindled almost to a vanishing point. For the present year the imports of pig will not exceed 8000 to 9000 tons, but they will have fully equaled the needs of the market. In the same way the imports of steel—that is, ingot steel—have dwindled down to a minimum. It may, therefore, be seen that this portion of the iron and steel business is not in a very hopeful state at present, but we look for a revival and a condition of things much better than they have been.

There is nothing stirring either in pig tin or tin plate and but limited additions to our supplies. We conclude that the outlook for next year's trade in them is fairly good. Notwithstanding all the predictions to the contrary the consumption of tin plate was very large during the year, the pack of fruits, &c., being the largest ever known, while that of salmon did not lag behind. Of nails there is nothing special to be said save that the low price continues, that there is a very good demand, and that imports both by rail and sea for the past couple of weeks have been very large.

### The Mint Director's Report.

According to the report of Mint Director Preston for the fiscal year ended June 30, 1894, just submitted to the Secretary of the Treasury, the gold coinage at the United States Mints during the year amounted to \$99,474,912, the largest ever executed in this country in any one year. The value of gold deposited is given as \$140,942,545. Deposits and purchases of silver during the year were 22,746,661 fine ounces, the coinage value of which in silver dollars is \$29,409,825. The amount of silver bullion purchased under the act of July 14, 1890, was 11,917,659 fine ounces, at a cost of \$8,715,521. The average cost per fine ounce being 73 13 cents. The total amount of silver purchased under the act of July 14, 1890, from August 3, 1890, the date the law went into effect, to November 1, 1893, the date of the repeal of the purchasing clause of that act, was 168,674,682 fine ounces, costing \$155,931,002, the aver-



TIN PACK SHEAR.

is 40 inches, but it may be made wider if so desired. It is constructed with the view of compactness, strength and rapid operation, which features have recommended it to many of the large mills of the country. The manufacturers are at present making eight of them for one plant, and they have also received orders for a new combined shear and doubler, sheet doublers, leveling rolls, &c.

Every shipbuilding country showed a decrease in construction last year, that of Great Britain amounting to over 25 per cent.

According to dispatches from Panama, the new company that has been formed for carrying on the unfinished work on the canal are meeting with no better success than did the old concern. Labor is scarce and dear, the appliances in use are largely unsuitable and of poor quality, and the work of construction is making little or no material progress. The impression appears to prevail that the revived company is one of straw,

Oakland shows a bright example to her sister city on this side the bay, where growling at our fate often takes the place of a little energy among too many of our manufacturers.

The general condition of our hardware and iron trades and of our manufacturing business too, during the past three months, has been one of improvement, and it keeps up still. There is no doubt that when manufacturers and merchants come to make up their accounts at the end of the year they will find the trial balance to exhibit more satisfactory results than they had at one time anticipated. Especially during the past six or seven weeks the shipments by rail have exceeded anything ever before known in the history of the State or city. There has been, too, a revival in wheat shipments. Add to that that the weather has been most propitious for plowing and preparing the land for another crop, and it will be seen that every encouragement is given to those whose prosperity or otherwise makes or unmakes trade. The prospects for another year are at present writing most certainly good, added to which prices are better than

age price per fine ounce being 92 44 cents.

The total coinage of silver dollars under the act of July 14, 1890, to July 1, 1894, was \$36,087,943, consuming 27,911,768 fine ounces, which cost \$29,110,647. The seigniorage of silver coined under the act of July 14, 1890, to July 1, 1894, was \$6,977,296. From July 1, 1894, to November 1, 1894, \$2,443,200 were coined. The seigniorage of the same was \$786,764 27, making the total amount of silver dollars coined under the act of July 14, 1890, \$38,531,143 and the total seigniorage \$7,764,060. The total coinage during the year was:

Gold.....	\$99,474,912.50
Silver dollars.....	758.00
Subsidiary silver.....	6,024,140.30
Minor coins.....	716,919.26
Total.....	\$106,216,730.06

The highest price of silver during the year was 76.45 cents and the lowest 59.18 cents, showing a fluctuation of 17.25 cents per fine ounce.

The value of the gold work in the industrial arts in the United States during the calendar year is estimated by Mr. Preston at \$12,523,528 and silver at \$9,534,277. The estimated stock of bullion in the United States on July 1, 1894, was: Gold, \$627,293,201; silver, \$624,347,757, a total of \$1,251,840,958. The production of gold and silver in the United States during the calendar year was: Gold, 1,739,323 fine ounces, of the value of \$35,955,000; silver, 60,000,000 fine ounces, the commercial value of the same being \$46,800,000 and the coining value \$77,576,000. Revised estimates of the world's production of the precious metals for the calendar year 1893 show the same to have been \$157,228,100 in gold and \$209,165,000 in silver.

## THE WEEK.

The cotton spinning industry has made great headway in the South during the current year. The latest New England concern announced to move hither in order to be nearer the source of supply of the raw material is the Massachusetts Cotton Company, who have determined to build a Southern plant to cost \$600,000, with a capacity of 30,000 spindles. The actual location is as yet not decided on.

The Government of Ecuador has purchased the fast Chilean cruiser "Esmeralda."

Labor organizations are greatly interested in the visit to the United States of John Burns, M. P., the foremost labor advocate of England, who arrived at New York on the "Etruria" on Sunday. Mr. Burns, while an avowed Socialist, is a man of high intelligence, who commands the esteem of his strongest opponents. He has come to investigate the labor question in this country and to attend the convention of the Federation of Labor, which meets in Denver, Col., on December 10.

Director Preston of the United States Mint Bureau estimates the stock of gold in the world at the end of 1893 for monetary purposes to have been \$3,965,900,000, and of silver \$4,055,700,000.

The process of placing the colossal bronze statue of William Penn on the top of the tower of the Philadelphia City Hall was completed on November 28, and the figure now stands at the highest elevation of any statue in the world. Alexander Calder, the sculptor

of the statue, has protested vigorously against the action of the people in charge of the work in fixing it so that the face of the figure looks toward the northeast instead of the south. He claims that the latter position, facing this light, is the only one in which the details can be seen at such a height. The Commission have, however, overruled his protest.

The completed portion of the Hennepin Canal, near Davenport, Iowa, was opened on Thanksgiving Day.

A. R. Whitehill, professor of chemistry and physics at the West Virginia University, after exhaustive experiments, is said to have succeeded in liquefying and solidifying natural gas. The result of his experiment is described as presenting the appearance of a lump of snow, which evaporates rapidly and disintegrates when brought in contact with the air, giving off a smoke like phosphorus.

The preliminary trial of the Ammen ram, now building at Bath, Maine, will be made early in the present month. Temporary conning towers are being fitted to the vessel in place of the delayed armored towers.

Immigration Superintendent Stump in his recently issued annual report for the fiscal year ended June 30, 1894, shows a very material falling off in the number of immigrants arriving in this country. He estimates that from October, 1893, to June, 1894, the number of foreign born steerage passengers leaving the country was greater than the number arriving from abroad. The extraordinary ratio of decrease is shown in the following table, which gives the number of immigrants arriving from the principal supplying countries during the fiscal year 1893-94:

Country.	1894.	Decrease.
Italy.....	42,977	29,168
Germany.....	52,989	24,942
Sweden.....	18,286	17,424
Poland and Russia.....	38,666	13,334
Ireland.....	20,281	13,347
England and Wales.....	18,748	10,926
Hungary.....	14,700	8,129

New York importers and exporters engaged in the Central and South American trade are discussing the desirability of forming a trading combination or trust.

The Herreshoffs have secured a five years' lease of the harbor frontage near their present yard, at Newport, from the estate of the late Captain Lawrence, and they will soon begin a considerable extension of their shipbuilding yards.

After mature consideration of the Brooklyn Navy Yard dry dock question, Secretary Herbert has decided to continue the contract of John Gillies, who has been directed to go on with the work.

According to the report of Governor Sheakley of Alaska, submitted to the Interior Department, the gold mining industry of the Territory is now very extensive. The adoption of the latest methods and machinery for the treatment of gold ores has rendered easy, successful and profitable the manipulation of the low grade gold bearing quartz found extensively in Alaska. During 12 months past 240,000 tons of ore were treated, yielding \$768,000, or \$3.20 per ton. The cost of mining and milling was \$324,000, or \$1.35 per ton, leaving a net profit of \$444,000.

Civil Engineer Endicott, who was sent from the Navy Department at Washington to survey the work done on the new dry dock in the Brooklyn Navy Yard by Contractor Gillies, has

made his report to the Chief of the Bureau of Yards and Docks, in which he states that only about 30 per cent. of the work has been completed and that it will be impossible for the present contractor to finish the work. The deepest excavation so far made is in the center, where it is 35 feet. The depth should be 40 feet. In portions of the dock not more than 1 foot has been dug. Contractor Gillies has stopped work on the dock until the decision of Secretary Herbert in regard to it is known.

State Engineer Adams will present to the New York Legislature early in January a scheme to substitute for the 16 locks above Cohoes, in the Erie Canal, a steel lift lock several hundred feet long, which may be raised or lowered 140 feet. Mr. Adams' scheme will, if carried out, result in the saving of many hours for boats traversing that portion of the canal.

All the St. Louis flour mills have closed down indefinitely, the millers claiming that the market is glutted with flour and suffering from overproduction.

Postmaster-General Bissell does not agree with his predecessor, Mr. Wanamaker, as to the desirability of instituting a postal telegraph system. Mr. Bissell cites the case of Great Britain, where the postal telegraph is operated at a loss, and he then asks: "If the establishment of a telegraph plant in a compact country like Great Britain would cost over \$52,000,000 what would be the cost of establishing a plant for this country?" With England's annual loss in operation \$800,000 Mr. Bissell thinks it would be many millions of dollars in a country the size of ours, with an unequal distribution of population. He, therefore, reaches the conclusion that as a business proposition the Government cannot afford at this time to establish a postal telegraph system, which would be likely not only to prove very unprofitable itself, but would tend to retard the development of the existing postal system.

A novel plan for catching trade is mentioned in the *Ironmonger* as having been adopted by the Arms and Ammunition Mfg. Company, a London corporation. Under this plan customers purchasing the goods of the company to any specified amount in one year are presented free with a life assurance policy for the same amount covering the following year. Thus, if a customer buys \$500 worth of goods in 1894, he is given a policy for that amount, valid during 1895, the assurance being guaranteed by a well known assurance office. The idea is good, and will probably be largely imitated.

The engineering, by a bookkeeper of the Shoe and Leather Bank of New York City, of a defalcation of \$354,000 in the accounts of the bank, and the recent flight of that official, together with the alleged suicide of his partner in the robbery, have given cause for many lively comments on the methods of bank examination which could allow such an extensive fraud to have been carried on undetected for years.

At a meeting of the general sales agents of the anthracite coal companies, held in New York on December 3, it was decided to restrict the output of anthracite during the current month to half the amount of the June production, namely, 2,600,000 tons. The tide-water point prices decided upon were \$3 50 per ton for broken, \$3.60 for egg and nut, and \$3.75 for stove size.

# The Iron Age

New York, Thursday, December 6, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## Bearing the Market.

Peculiar influences are actively at work in weakening iron and steel prices. This is naturally a dull period in several important branches of trade, as outdoor work is interrupted by the inclemency of the weather, and also the close of the year is approaching, when inventories are generally taken. But prices are weaker than such causes alone should make them. There is hardly a manufacturing establishment in the country that is not in much better shape than it was at the beginning of last winter, and for which the future is not a great deal brighter than for many months. Confidence is being renewed and hopefulness is the predominating spirit. Yet there are very few indications of firmness in values, but, on the contrary, the low range touched last spring seems about to be beaten by a new record. The responsibility for this state of affairs is disclaimed by manufacturers, who charge it upon the merchants and brokers. They are pursuing the same methods which they have hitherto found profitable. The steadily declining prices of the past four years have afforded iron and steel brokers golden opportunities. They have steadily anticipated the market. They have not hesitated to take contracts which at the time manufacturers would not touch. Further than that, they have boldly underbid manufacturers on sundry classes of material which had to be bought from these very manufacturers. The greater the magnitude of such operations the easier they have been to successfully consummate.

The natural conservatism of most manufacturers has greatly promoted the development of this class of trade. They are fettered by their cost sheets and the desire to secure some profit on the work passing through their establishments. The broker troubles himself little about costs, but banks on the tendency of the times and takes his chances in selling against the almost inevitable decline which he has until now perceived in the immediate future. When necessary he gathers in a number of comparatively small orders from several consumers, thus securing a bunch which will enable him to get exceedingly favorable treatment from a manufacturer. Although the manufacturer may have bid on some of these orders a price which he considered as low as he dared go, yet it is hard for him to resist the subsequent proffer of

a large amount of work at even a lower rate. He is apt to take the chances on trying to reduce cost in some direction, especially if the market is in such shape that he fears competing houses will take the business he passes. For a long time orders have been too scarce and current business has been too much below the capacity of manufacturing establishments to warrant the refusal of contracts coming up in this way.

Another consideration which has built up the business of the brokers is their general financial strength. The business is not one in which men of limited capital can easily engage. The most successful brokers are those who are able to assume the entire financial responsibility and pay for the material themselves, taking the risk of collecting from the consumer. This is especially inviting to a manufacturer, who is sure of getting his money promptly, and avoids anxiety on the score of bad debts. Not a few manufacturers are very favorably inclined to this method of doing business, probably because it relieves them from a large part of the uncertainties of trade, just as other manufacturers cultivate the favor of jobbers in preference to retail merchants or consumers, even though a somewhat lower price must be taken.

It is now a question as to whether these tactics can safely be pursued much further. Evidently the brokers think they can be, for they have latterly made quotations of an apparently reckless character when the better condition of the iron and steel trades is taken into consideration. Their guesses as to the future of prices may be nearer the mark than those made by others in the trade. But there is such a general expectation of a great expansion in the volume of business after the turn of the year that the outcome of their present operations will be awaited with much interest.

## More Care Needed in Casting Houses.

The casting house of a blast furnace is not expected to demand a very high development of the art of molding. Pig iron represents the very crudest form of casting. The main object of preparing the bed is to divide the product of the furnace into sufficiently small portions so that it can be conveniently handled. The skill of a gang of casting house men is mainly directed to securing a proper shape from the furnace so that the stream of molten metal will flow easily and rapidly to the most distant part of the bed. Many founders are content with this, and care very little about the exact shape in which the pigs are cast. This carelessness as to shape, however, did not always prevail. Until recent years founders took much pride in preparing their molds, and the pigs then made were uniformly of the conventional pig iron shape. A change has been wrought in this respect by

the great increase in the number of blast furnaces operated in connection with steel works and rolling mills. The pig iron there made being intended merely for consumption in another part of the same works, and not for sale to other consumers, more attention has been given to magnitude of output than the appearance of the pigs. Founders thus educated have drifted into the merchant pig iron trade, and there manifest the same indifference to the preservation of a symmetrical shape to their product. This may seem to be a matter of very small importance, but it is not so considered among foundrymen. When they receive pig iron cast in chunks, slabs and all sorts of irregular forms, they naturally feel that carelessness in this respect implies slovenly methods in the operation of the furnace, and they are suspicious of the quality. They feel that it is necessary to apologize to a visitor who happens to pass through the foundry yard and who may notice the difference in appearance between a pile of this sort of pig iron and a pile received from some other furnace whose founder continues to adhere to the old traditions of the trade, and turns out pig iron so that every pig bears a resemblance to its mates. It must influence foundrymen to some extent, therefore, in placing their orders; perhaps to a greater extent than even the foundrymen themselves would care to acknowledge.

The annual report of the Nicaragua Canal Company to the Secretary of the Interior Department, just published, states that since the organization of the company in 1889 10,145 shares of the capital stock have been subscribed for at par, amounting in the aggregate to the sum of \$1,014,500, of which amount \$1,007,840 has been paid into the treasury in cash. From other sources there has been paid into the treasury \$62,117, making a total of \$1,069,957. The expenditures since the organization for administration purposes were \$844,882 63. They issued 180,000 shares of their capital stock at the par value of \$18,000,000 in payment for concessionary rights, privileges, franchises and other property. The liabilities of the company are \$6,855,000 and cash liabilities not exceeding \$30,000. The extreme depression in the money market has caused serious embarrassment to the company by rendering difficult the sale of their securities. Consequently no material progress in the construction work has been made since the former report of the company. It is, however, hoped that better conditions leading to a vigorous prosecution of the work will prevail in the future.

By a recent decree of the Supreme Court of the State of Panama the ordinance of July 2, 1894, imposing an ad valorem duty of 10 per cent. on goods entered at the ports of Colon and Panama has been declared unconstitutional. Hereafter goods entering at these ports will not be required to pay this additional duty. It is not thought, says the *New York Journal of Commerce*, the Supreme Court of the Republic of Colombia will interfere with this decision.



## OBITUARY.

## CARL AMSLER.

Carl Amsler of the firm of McClure & Amsler, the well known engineers and contractors, of Pittsburgh, died at his residence on November 22.

Mr. Amsler was a native of Germany and came to Pittsburgh in 1870. His first business connection was with the Keystone Bridge Works, as draftsman, and from that position he went to what is now the Homestead Steel Works, where he was placed in charge of the constructing department. After remaining at Homestead for some years he went to Wheeling, where he had entire charge of the erection of the new Bessemer steel plant of the Riverside Iron Works, and operated it for two years after its completion. After leaving Wheeling Mr. Amsler again came to Pittsburgh and entered the employ of Mackintosh, Hemphill & Co., and while connected with this firm he superintended the erection of the Bessemer plant of the Laughlin & Junction Steel Company, at Mingo Junction, Ohio, and afterward superintended the construction of the original plant of the Duquesne Steel Works, which was also built by Mackintosh, Hemphill & Co. In 1889, upon the death of Mr. Schuler of McClure & Schuler, Mr. Amsler entered that firm and it was reorganized as McClure & Amsler, which connection he retained until his death. Mr. Amsler was an engineer of rare ability and had charge of the erection of some of the most important iron and steel plants in the country. Mr. Amsler leaves a widow and three sons and also an adopted daughter. The oldest son is now taking a course in Cornell University.

## W. E. WILLIAMS.

W. E. Williams died at Muscatine, Iowa, on the 22d ult., having resided there for the past year superintending the operations of the Williams Rolling Mill. Mr. Williams was an engineer by profession and his services have been employed in conducting rolling mills in this country and in mining in Mexico, he having been a resident of Durango for a number of years, and had expected to return there next spring. At the breaking out of the Civil War he volunteered his services to the Union cause and served in an Ohio regiment until the close of the war. His brother, S. T. Williams, recently removed to New Philadelphia, Ohio, and another brother is in the United States Navy. The deceased was about 48 years of age.

## HENRY P. FOCHT.

Henry Potts Focht, superintendent of A. & P. Roberts & Co.'s Pencoyd Iron Works, Pencoyd, Pa., died on Sunday night, December 2, at his residence, Roxborough, Pa., of consumption of the throat. Mr. Focht had suffered for several years from the disease which caused his death, but had only been seriously ill a few weeks. He was

born in Reading, Pa., October 7, 1830. After receiving a limited education he entered an iron mill in that city and learned the business of a heater. He joined the Pencoyd Works 40 years ago—soon after their first establishment—and progressed through various grades from heater to superintendent, advancing with the growth of the works from a one furnace mill to its present importance.

Plans are on foot for the construction of two electric railroads from Baltimore to Washington, D. C., and Gettysburg respectively. The company who propose to build the Baltimore-Washington road are advertising for bids for constructing 16 miles of double track road from Washington to Laurel. The specifications provide that the road shall be laid with 80-pound steel rails, and shall be so ballasted and constructed as to



CARL AMSLER.

support electric trains attaining a speed of 60 miles an hour. Three steel bridges are also included in the specifications. It is proposed to complete the entire line within a year. The distance from Baltimore to Gettysburg on the line which the electric railroad will take is 50 miles. The Elkins-Widener Street Railway Syndicate are said to be the moving spirits in both these projects.

At Roach's shipyard, Chester, Pa., was launched last week one of three fine new ferry boats ordered by the New York & Brooklyn Ferry Company. The dimensions of the "America," which is the name of the first boat, are: Length on keel, 155 feet; length over all, 168 feet; beam, 62 feet; depth amidships, 14½ feet. The vessel is a double ender, constructed of iron. She is a two-decker and is furnished with all the most modern appliances. Her two sister boats, the "Columbia" and the "Vermont," will be ready for launching in a few weeks.

## Cost of Producing Electricity.

In the *Electrical World* J. B. Cahoon insists that a factor which enters not a little into the cost of producing electricity is the arrangement of steam piping throughout the station and the utilization of the exhaust steam or waste gases to heat the feed water. Many of our small stations throughout the country, which are running non-condensing, will find it a very great advantage to make use of their exhaust steam in this way, as every degree of heat gained in the temperature of the feed water means that it takes so much less coal to get the desired result. No matter by what diversified paths we go in seeking economy, we find they all eventually end in the coal pile, and all the various economizers and devices to produce economy of this or that are, in effect, an arrangement to save waste in the coal pile, and therefore the wise station manager will do everything that he can to save at this point. So much has been said in regard to the gain that can be made by the introduction of condensers that it seems trite to add anything further, but a very good example of this came to my notice a short time ago and I give it, in the hope that it will lead other station managers who are now running non-condensing to investigate their surroundings, and if possible to change their stations over so as to run their engines condensing. The station which I have in mind has a maximum output of about 1500 horse power, divided into small units. The general manager of this station, who is one of the ablest in the field, and fortunately possesses a good knowledge of steam engineering, shortly after his appointment saw the advantages to be gained by running condensing, and after a careful investigation laid the matter before the Board of Directors and kept at it until the change was authorized. In order to obtain the necessary supply of water it was found that they must either use city water or run a line of piping on their own account into the harbor, some 1200 feet distant, and draw their supply from that source. The latter plan was finally decided upon and has been consummated, with the result that it has effected an average actual saving of \$25.71 per day in their coal consumption, which at the price they pay for coal is equivalent to 7½ tons per day. To offset this saving lies the interest on the cost of the pumps and the laying of the piping, together with the cost of the power for driving the pumps; this last, of course, being quite small and hardly noticeable in a day's run.

Every manufacturing plant at Anderson, Ind., except the Hazen Wire Nail Works, is reported to be running at full capacity. It is reported that the nail works are to be sold by John F. Hazen of Cincinnati to a syndicate of Indianapolis capitalists, who will add a wire rolling mill. The plant has been standing idle for two years.

## CORRESPONDENCE.

**Distinguishing Iron and Steel.**

*To the Editor:* It is very important for us to be able to distinguish in a simple manner whether iron or steel sheets are being delivered to us. Can you give us such a test? ENAMEL.

We know of no better way than to try the method of doubling up pieces of the sheet metal you wish to examine, hammer them flat and examine the bent surface. There are two signs which mark the difference between the two. The iron is duller, has less luster than the steel. If you feel the bent surfaces you will notice the steel feels smoother under the touch, or slight rubbing, than the iron. This is especially pronounced in the thicker pieces. This difference in feeling is the greater the more ordinary the iron is. With very thin sheets this difference naturally disappears more or less, and we have to call in the aid of a pocket lens. With the help of that we notice that the surface of the iron is rougher than the surface of the steel, even in the best of sheets, due to the difference in structure of the two metals. The best iron and the best steel (sheet) come nearest each other, but there is still some difference. On close examination you will notice that the iron has a finely grained skin, as if there were pores. This contributes to its duller luster. On steel the scale comes off more easily, too. There was a time when sheet steel could be distinguished from sheet iron by its "ring" or sound when struck with a hammer, just as some experts can pretty near tell a passenger axle from a freight axle if laid among a pile on the ground and struck on the journal, by its "ringing" or higher pitch and the feeling of a "spring," as they call it. So it was with sheet steel. But now this distinguishing mark does not exist any longer. In its make up and working qualities it is so much like best sheet iron that, as the foreman of the tin shop of a great establishment states, no one is able to tell which is which.

**Pig Iron Quotations.**

*To the Editor:* Will you kindly explain the reasons for the following peculiarity of the pig iron quotations in your issue of this date:

	No. 1 Foundry Coke.	Bessemer.
Chicago, local.....	\$10.25	\$11.25
Cincinnati, L. S.....	12.0	12.00
Pittsburgh.....	11.75	10.50

In Chicago Bessemer is \$1.00 higher than No. 1.  
In Cincinnati Bessemer is 50 cents lower than No. 1.  
In Pittsburgh Bessemer is \$1.25 lower than No. 1.

Why should Bessemer ever be lower than No. 1 Foundry? Is it not just as difficult to make in the furnace, and are not the ores from which it is made always as high priced, if not higher, than those used for No. 1?

INQUIRER.

PASSAIC, N. J., November 22, 1894.

The prices are made, not by the cost, but by the influences affecting the different markets. Thus the prices for local foundry iron at Chicago are dictated by the competition with Southern makes, while the requirements for Bessemer of the open market in that section are small, and not vigorously contested for by distant makers. Both Lake Superior foundry and Bessemer pig iron are unimportant in Cincinnati, which

is the great market for Southern irons. Pittsburgh controls the Bessemer pig market, but is a very unimportant factor in foundry iron.

**The American Society of Mechanical Engineers.****FIFTEENTH ANNUAL MEETING.**

The convention of the American Society of Mechanical Engineers, now in session at the house of the society, New York City, bids fair to be one of the most important ever held. The papers to be read are many, and the subjects they treat of are important and of timely interest. The attendance is larger than at any other meeting, the register containing on Tuesday evening, the first business session, the names of over 300 members. These points indicate the rapidly growing interest in the society and its work, and the reports which were presented of the standing committees show the society to be on a strong financial basis and to have a large and rapidly growing membership.

A most admirable plan of what we may term "self presentation" was introduced at this meeting. It was simple, effective and met with general approval. The lines of the register were numbered consecutively. Each member, when he registered, was presented with a hard rubber tag bearing the same number as the line he had registered upon. Each tag was formed with a slot so that it could be held upon the coat lapel by the usual button. In addition the registry list was printed in the order in which it was signed, and these strips of printed names were distributed. Further than this, the members of the Reception Committee were provided with a tag bearing their names. By the aid of this simple method every member could, if he so desired, know the name of every other member. If a member wanted to know the name of another he noted the number on the other's tag and consulted his printed list. The members of the Reception Committee were selected, not from those resident in or near New York alone, but also from those living in different parts of the country. The object of this was to provide a committee which, considered as a whole, would be acquainted with all present.

Among those in attendance were:

H. A. Bang, Benham & Bang, consulting engineers, New York.  
Charles E. Billings, president Billings & Spencer Company, Hartford, Conn.  
James Brady, manager and treasurer Brady Mfg. Company, Brooklyn, N. Y.  
Wm. L. Chase, Knowles Loom Works, Worcester, Mass.  
E. F. C. Davis, president elect of the society, general manager Richmond Locomotive & Machine Works, Richmond, Va.  
Esteban Duque Estrada, Pittsburgh, Pa.  
Alex. Gordon, general manager Niles Tool Works, Hamilton, Ohio.  
Charles Edwin Hart, mechanical superintendent Stanley Works, New Britain, Conn.  
Alexander Henderson, Chief Engineer United States Navy, New York.  
Charles J. Hillard, Pittsburgh, Pa.  
Charles Wallace Hunt, New York.  
Frederic R. Hutton, professor mechanical engineering School of Mines, Columbia College, and secretary of the society, New York.

William J. Keep, Detroit, Mich.

Charles Kirchhoff, editor *The Iron Age*, New York.

Harry M. Lane, president Lane & Bodley Company, Cincinnati, Ohio.

Teile H. Müller, consulting engineer Geo. M. Newhall Engineering Company, Philadelphia.

Edgar Penney, general superintendent Frick & Co., Waynesborough, Pa.

Thomas R. Pickering, Pickering Governor Company, Portland, Conn.

Reid T. Stewart, professor M. E. Western University, Allegheny, Pa.

John H. Webster, superintendent engineer American Sugar Refining Company, Boston, Mass.

George W. Weeks, Clinton, Mass.

Thomas D. West, manager Thomas D. West Foundry Company, Sharpsville, Pa.

Chas. Whittier, Boston.

Wm. H. Wiley, treasurer of the society, New York.

Robert Sever Hale, testing engineer Edison Electric Illuminating Company, Boston.

Chas. T. Porter, Montclair, N. J.

Thomas R. Almond, Brooklyn, N. Y.

Frank Ruel Baldwin, Bass Foundry & Machine Works, New York.

Stephen W. Baldwin, New York agent Pennsylvania and Maryland Steel Companies, New York City.

J. N. Barr, superintendent Mo. P. C. M. & St. P. R. R., West Milwaukee, Wis.

Henry B. Binsse, Newark Machine Tool Works, Newark, N. J.

Geo. M. Bond, manager standards and gauge department Pratt & Whitney Company, Hartford, Conn.

Andrew J. Caldwell, mechanical engineer H. R. Worthington, New York.

Rolla C. Carpenter, associate professor of expert engineering Sibley College, Cornell University, Ithaca, N. Y.

Robert Cartwright, Rochester, N. Y.

Eckley B. Coxe, Drifton, Pa.

P. B. De Schweinitz, mechanical engineer Bethlehem Iron Company, Bethlehem, Pa.

Wm. H. Doane, Cincinnati, Ohio.

Fred. H. Daniels, general superintendent Washburn & Moen Mfg. Company, Worcester, Mass.

W. F. Durfee, West New Brighton, N. Y.

Charles E. Emery, New York.

Frederick C. Fladd, mechanical inspector E. W. Bliss Company, Brooklyn.

Stanley G. Flagg, Jr., Philadelphia.

Matthias N. Forney, editor *American Engineer*, New York.

Arthur J. Frith, Trenton Iron Company, New York.

John Fritz, Bethlehem, Pa.

Horace B. Gale, Natick, Mass.

Henry Laurence Gantt, Philadelphia, Pa.

S. Ashton Hand, Philadelphia, Pa.

Gustavus C. Henning, New York.

J. F. Holloway, consulting engineer Snow Steam Pump Company, New York.

John J. Hoppes, president Hoppes Mfg. Company, Springfield, Ohio.

D. S. Jacobus, assistant professor experimental mechanics Stevens Institute, Hoboken, N. J.

Wm. Henry Jaques, New York.

Washington Jones, Philadelphia, Pa.

Wm. Kent, Passaic, N. J.

C. V. Kerr, professor mechanical engineering Arkansas Industrial University, Fayetteville, Ark.

J. S. Lane, general superintendent M. C. Bullock Mfg. Company, Chicago.

John R. Matlack, Jr., M. E. Riehle Bros. Testing Machine Company, Philadelphia, Pa.

David J. Matlack, Philadelphia, Pa.  
 John T. Meatz, superintendent Mason Machine Works, Taunton, Mass.  
 Fred. J. Miller, editor *American Machinist*, New York.  
 Lebbeus B. Miller, superintendent the Singer Mfg. Company, Elizabeth, N. J.  
 D. G. Moore, vice-president S. L. Moore & Sons Company, Elizabeth, N. J.  
 M. F. Moore, secretary and treasurer S. L. Moore & Sons Company, Elizabeth, N. J.  
 Charles H. Morgan, Worcester, Mass.  
 Geo. S. Morison, Chicago, Ill.  
 Chas. L. Newcomb, superintendent Deane Steam Pump Company, Holyoke, Mass.  
 Robert Van A. Norris, assistant engineer P. R. R. Coal Company, Wilkes-Barre, Pa.  
 Frank J. Plummer, Wilkes-Barre, Pa.  
 William Porter, Wheeler Condenser & Engineering Company, New York.  
 Francis H. Richards, Hartford, Conn.  
 George Richmond, mechanical engineer, De La Vergne R. M. Company, New York.  
 Charles Bradley Rowland, chief engineer Continental Iron Works, Brooklyn, N. Y.  
 Thos. Fitch Rowland, president Continental Iron Works, Brooklyn, N. Y.  
 James Edward Sague, mechanical engineer Schenectady Locomotive Works, Schenectady, N. Y.  
 John W. Sargent, Rice & Sargent Engineering Company, Providence, R. I.  
 F. A. Scheffler, the Stirling Company, New York.  
 John Franklin Seavey, Ludlow Mfg. Company, Ludlow, Mass.  
 M. W. Sewall, superintendent engineering department Babcock & Wilcox Company, New York.  
 James Alward Seymour, McIntosh, Seymour & Co., Auburn, N. Y.  
 Angus Sinclair, editor *Locomotive Engineering*, New York.  
 Oberlin Smith, president Ferracute Machine Company, Bridgeton, N. J.  
 Albert Spies, associate editor *Cassier's Magazine*, New York.  
 Norman C. Stiles, Middletown, Conn.  
 George S. Strong, chief engineer Strong Locomotive Company, New York.  
 H. H. Suplee, mechanical engineer, Yale & Towne Mfg. Company, Stamford, Conn.  
 Harris Tabor, Elizabeth, N. J.  
 Herbert Gray Torrey, U. S. Assayer, New York.  
 Henry R. Towne, president Yale & Towne Mfg. Company, Stamford, Conn.  
 Worcester R. Warner, Warner & Swasey, Cleveland, Ohio.  
 H. W. Wyman, Wyman & Gordon, Worcester, Mass.  
 George E. Whitehead, superintendent nut and bolt works Rhode Island Tool Company, Providence, R. I.  
 Baxter D. Whitney, Winchendon, Mass.  
 John F. Wilcox, general manager Pittsburgh Iron & Steel Engineering Company, Pittsburgh, Pa.  
 J. G. Winship, M. E. Geo. F. Blake Mfg. Company, New York.  
 C. J. H. Woodbury, American Bell Telephone Company, Boston.  
 Louis S. Wright, superintendent Camden Iron Works, Camden, N. J.  
 H. F. Frevert, Garvin Machine Company, New York.  
 Fred. R. Low, editor *Power*, New York.  
 Edwin R. Bullock, mechanical engineer J. & P. Coats Company (Ltd.), Pawtucket, R. I.  
 Ralph E. Curtis, Lockwood Mfg. Company, East Boston, Mass.

Howard Wells Smith, mechanical engineer Kinsman Block System, New York.

The first session, which may be considered as mainly providing an opportunity for the members to renew acquaintances, occurred on Monday evening, the 3d inst. The following topical questions were discussed: "Are there certain general principles underlying the proper connection of steam boilers and engines in a power plant?" and "What form of filing cabinet have you found most convenient for clippings, &c.?"

#### Officers Elected.

The report of the tellers showed that the following officers had been elected: President, E. F. C. Davis, general manager Richmond Locomotive & Machine Works, Richmond, Va.

Vice-presidents, F. H. Ball, New York City; Jesse M. Smith, Detroit, Mich.; M. L. Holman, St. Louis, Mo. The vice-presidents holding over are: C. E. Billings, Hartford, Conn.; Percival Roberts, Pencoed, Pa.; H. J. Small, Sacramento, Cal.

Managers, John C. Kafer, New York City; Chas. A. Bauer, Springfield, Ohio; Arthur C. Walworth, Boston, Mass.

The managers holding over are Chas. H. Manning, Manchester, N. H.; C. W. Pusey, Wilmington, Del.; John Thompson, New York City.

Treasurer, Wm. H. Wiley, 53 East Tenth street, New York.

#### Reports of Standing Committees.

The present membership of the society, including those elected at this meeting, is 1690, and is distributed among the grades as follows:

Honorary members.....	16
Members.....	1,346
Associates.....	71
Juniors.....	257
Life members.....	59

The report of the Finance Committee showed that the actual cash receipts from regular sources for 1893-4 were \$27,514.92, and the actual amount of expenses for that year \$26,798.91. The society has an investment of \$19,000, bearing 5 per cent. interest, in bonds of the Mechanical Engineers' Library Association, the owner of the building in which the society meets. The next meeting of the society will be held in Detroit during the first week in July next.

#### Amended Rules.

Several amendments proposed at the last meeting were adopted. One of the most important was the following: "All persons connected with engineering may be eligible for admission into the society." Under the old rule those eligible were mechanical, civil, military, mining, metallurgical and naval engineers and architects. As was explained, the new rule was proposed in order to admit the electrical engineer, whose profession had practically come into existence during the past ten years. The new rule is worded so as to make it applicable during the future even though many new branches of engineering should attain prominence. A candidate for membership must be not less than 30 years old, and for the associate grade not less than 26 years old.

Gus. C. Henning of the Committee on Uniform Standards for Test Specimens and Methods of Testing, explained that the report would be a series of monographs by the different members of the committee. The first

report was presented in abstract by W. J. Keep and it was given a subtitle of "Relative Tests of Cast Iron." The paper states that relative tests are such as are applicable to every case. In such a test any size of test piece might be selected, and having made one test record, every other record by the same method is so much greater or less than the original, which is regarded as standard. There is a direct relation between the test record and the composition of the iron, also between the record and size of the casting and also its shape. A relationship also exists between the test record and the conditions attending the melting and handling of the iron and the making of the castings.

It would be well to fix upon a given size of test piece, which would be used by all, and a fixed routine should be prescribed so as to prevent as much as possible variations in conditions. The only variable would then be composition. The test record would in ordinary foundry practice indicate changes in composition. If the composition and routine in each case were known records by different persons could be compared. The author then explains that the object of the paper is to provide a means for determining the physical quality of a casting of any size or shape from the test record of any size of test piece which it may be thought best to use.

The next paper was by Geo. M. Sinclair on

#### "Notes on Steel Forgings."

We propose to note some of the general principles controlling the manufacture and use of steel forgings. A forging may be good or bad, independent of its material, so that we shall avoid metallurgical questions, and take only what may be called the mechanical view of the subject. This will exclude questions of composition and many other interesting and important subjects. By "steel," the ordinary carbon steel is referred to, although the statements made apply with equal force to many or all of the numerous other varieties.

The first point to be considered is the design of the forging. Iron forgings are essentially built up, so that it follows that great irregularities of shape are of small moment, so far as the manufacture is concerned. A steel forging, on the other hand, is made from an ingot, which at the outset must be sufficiently large in section to make the largest part of the desired forging out of it. It cannot be enlarged in section except in minor cases, when it may be upset or have a piece welded on. But it is highly objectionable to weld in steel, especially where any strain is put on the weld; and with some grades of steel welds are altogether out of the question, and even with soft steels they are undesirable. Cases may be met with, however, in which it is desired to fill out a forging at a point where no stress of importance will come, as, for instance, to form a boss to carry an oil cup, when a piece of iron or soft steel may be "jumped" on in preference to making a set down. As a rule, however, avoid all welds. The designer must remember the conditions, which are mainly these: An ingot of practically uniform section to start with, and a material which demands as few heats as possible and does not permit of welds. It follows that he must make his design as simple and uniform as possible, avoiding large collars, arms, sharp set-downs and other irregularities of form. In re-

turn he will get a forging which has been finished in a few heats, at low cost, accurate to size and giving the machine shop a minimum of work.

#### Heating.

The design completed and furnished to the forge master, the billet or ingot is selected and goes into the heating furnace. What is the condition of an ingot? After being cast it has cooled rapidly from the outside. Since the heat of the interior has passed off through the outer portions of the mass, the interior has necessarily been at a higher temperature than the surface during the entire cooling process, and the more rapid the cooling the greater the difference of temperature between the exterior and interior. The surface has finally set rigidly while the interior was plastic or even fluid. While the interior was still fluid the shrinkage at the lower portion of the ingot is fed from above. Frequently this is at the expense of a hole, or "pipe," at the upper end; but even if the ingot when cooled is solid throughout, the metal is under stress. It is as if a quantity of steel were put in a rigid shell too big for it, and were stretched out in all directions to fill it. Now suppose this rigid shell is expanded by heat so quickly that the heat is not transmitted in any appreciable amount to the interior, it follows that this interior portion must immediately stretch more in every direction, or it will not fill the interior of the shell. So the interior of an ingot is under stress when put into a heating furnace, and these stresses are increased as its exterior is expanded. If the heating is not done slowly, so that before much additional stress is induced the interior has acquired heat and begun to expand, and the whole ingot is thus gradually brought to a plastic condition, there may be internal cracks in the ingot when it goes to the forge. This danger is not great with small ingots, but large ingots will sometimes crack with a noise like a bell while still almost cold.

#### The Heating Furnace.

To heat slowly, and at the same time economically, requires careful consideration in designing the furnace. Some furnaces under favorable conditions will heat 10 pounds or even more for 1 pound of fuel. There are other furnaces in use which do not do better than pound per pound. If very large pieces are to be heated, requiring high temperatures for a long time, the regenerative form of furnace will effect great economy of fuel. If, on the other hand, a great number of small pieces are handled the furnace might be made long, and the work passed gradually from the cool end to the hot end. This is a form of continuous furnace with many advantages, but with any furnace, however, a mild, reducing flame must be kept to avoid "burns" and scaling. The ideal way of heating is to reverse the operation of the cooling—that is, heat from the inside outward. With present appliances this is not possible, except with bored ingots, which are only used for hollow forgings. Perhaps our electrical friends will perfect a system by which, for example, we shall wrap an ingot in asbestos, run two poles up against the ends, turn a switch and find our ingot heating rapidly, safely and with almost no loss from scaling. In such a system, the expense of a furnace would be offset by that of boilers, engines and dynamos, but it would be rash to say that this may not be the method of the future,

even for large work. This operation of heating is the first one which the forge undertakes, and is one where in the majority of cases a considerable saving could be effected. The requisites for that object are primarily a well designed and constructed furnace, and secondarily, intelligence in using it. No fixed rules can be given to fit all cases, but each must be carefully studied.

#### The Hammer and the Press.

In the manufacture of a forging the forging process itself furnishes the most obvious field for introducing economies and safeguards, and has therefore probably received most attention. To change the form of a mass there must be a flowing of particles over one another against a certain amount of resistance. Time is an essential factor of this flowing. In making a forging, therefore, we have a force acting through space during time, and all three factors—the force, the space and the time—are variable. Bearing in mind these general considerations, a few words on the relative merits of the steam hammer and the hydraulic forging press will not be out of place. The action of the hammer differs from that of the press mainly in the time effect of the blow. Suppose a similar blow from the two machines—that is, the same area and mass of metal deformed to the same extent. Then, in the case of the hammer, the inertia of the falling mass is absorbed by the metal in a very short time, in which the velocity is reduced from the maximum to nothing. For our comparison, take that type of press in which the pumps deliver water to the cylinder. There we have the falling weight of the hammer paralleled by a revolving fly wheel, and the steam in the cylinders of the engines acting during the blow would correspond to top steam in the hammer. The "work" in the press, however, would not absorb the entire energy of the fly wheel, for, of course, the water will be shut off before the engines are stopped. The duration of the blow is greatly lengthened, and the velocity of the die is much less than that of the fly wheel, but, as in the hammer, there is a retardation from the time the die touches the metal until the deformation is completed. The nearer the blow to the capacity of the press, the greater the retardation, and the further from that limit the more nearly uniform the velocity of the blow. In fact, the hammer becomes a press when the trip is so heavy that it does its work without any fall, and the press would be a hammer in effect if the stored energy of the fly wheel were transmitted so directly as to be absorbed in the same time as the energy of the falling trip of the hammer. While such construction is impractical the illustration shows that within limits the two systems do approach each other in every day practical work. To sum up, it may be said the press differs from the hammer in that by the intermediary of water and the enlargement of the water passage at the cylinder of the press we retard the blow and extend its effect over a much greater time.

This being the difference of action of the two system, which will give a better product? Theoretically, under the press, the particles having ample time to flow, the treatment is not so severe. Practically, however, under a hammer properly proportioned to the work, the particles have then likewise ample time to flow. In other words, the press takes a needlessly long

time to effect the deformation. Of course we refer only to steel. Other materials may require all the time, or even more, for deformation, which they would have under the press as now constructed. But for steel, the product of the hammer is equal, if not superior, in quality to that of the press. There is, however, a chance for bad practice in the use of hammers which does not exist with presses. A light hammer driven at a high velocity expends its energy on the surface of the forging. The interior not only is not compacted and worked, but it is actually opened up and even ruptured. While hammer forgings can be so made, and may in use have, or soon develop bad internal cracks, with the press this is impossible, and this fact is a guarantee to a certain extent to justify the use of hydraulic pressed forgings.

It is the distinction in the operation of light and heavy hammers, above noted, which has given rise to the prejudice often found against top steam. This prejudice has little foundation, and it would be a mistake to build a hammer for general forging purposes without it. It is the unfortunate property of all steam hammers that the larger the forging and, therefore, the greater the power required, the less power is there available, since the large size of the forging reduces the stroke of the hammer. Top steam enables the hammer in effect to lengthen its stroke. That is, it will give the tup at part stroke the same velocity that it would acquire by gravity at full stroke. This gives the hammer vastly greater range without necessarily trespassing on the forbidden ground of high velocities. Further, it increases the product, for a greater number of blows can be given in the same time than with a hammer actuated only by gravity. The use of top steam is legitimate; its abuse must be guarded against.

The advantages of the press over the hammer rest chiefly on merits appealing to the manufacturer of forgings. Except for some varieties of plain work the best designed presses are quicker than hammers, their running expenses are less, and, above all, owing to the absence of shock, they are much more mechanical tools, forgings being turned out from them with precision and ease which could not possibly be made at a hammer. These advantages can scarcely be overestimated. Perhaps the severest criticism brought against the press is the comparatively high heat at which forgings are finished. As all forgings are or should be annealed before being put into use, this criticism has little force.

Whether the forging is made by a press or by a hammer, the virtues or faults of the design must be considered by the hammer man. Before beginning work he must plan it. All reheating and especially reheating of finished parts must be avoided. It is time well spent to think out every operation beforehand, to have dimensions calculated and templets prepared for various critical points of the manufacture, and, in short, so to prepare that almost any contingency which may arise has been foreseen. When a piece is heated and brought to the hammer or press, there is no time for deliberations and consultations. If they become necessary, it is at the expense of the economy and quality of the work.

#### Annealing.

The forging being made it remains to "treat" it. The usual treatment is annealing or oil tempering and anneal-



ing. Exactly what takes place in a piece of steel submitted to these processes is not certainly known, but the physical results are pretty well understood. In most cases the treatment will consist only of annealing. Formerly the annealing process was a very perfunctory operation, and frequently was omitted altogether. To-day it is generally and rightly regarded as important. All steel comes from the hammer or press with internal stresses more or less severe. The particles are in a disturbed condition, and cannot adjust themselves while the metal is cold; at least, not in a reasonable time. Annealing relieves these stresses. It will also break up crystallization more or less effectively. The effect of annealing is shown by the testing machine by a reduction in tensile strength and increase in extension. To anneal properly, furnaces for the purpose should be used. The old method of burying in lime or ashes, though beneficial, is uncertain and incapable of accurate results. The design of the annealing furnace, like the heating furnace, is capable of much variation, and for best results must be made to suit the peculiarities of each case. The fuel may be wood, coal, gas or oil. The essential characteristics are, that it shall enable the work being treated to be brought up to any desired temperature slowly and uniformly, and again cooled in the same manner. With these two points provided for, all other devices and arrangements of furnace for facilitating work and for economy may be introduced. For high class work, the temperatures of the furnace, composition of the metal and physical tests must be noted. In fact, no one at this time can hope to compete for high grade work without the free use of the chemical laboratory and testing machine and making and preserving more or less elaborate records.

#### Oil Tempering.

There is a great variety of other processes by which forgings may be treated, such as case hardening, Harveyizing, hardening in water, oil tempering, &c., but the last mentioned is of more general applicability than any of the others, and we shall close by a reference to it. Its most obvious effect on steels having a moderate percentage of carbon seems to be of a physical character analogous to forging. The sudden contraction due to the chilling of the surface compacts the metal and breaks up crystallization. At the same time the suddenness of the cooling in itself has a tendency to check or prevent the formation of crystals. It is evident from the above and also from experience that the thicker the metal the less will be the effect of the oil tempering, and at no very great thickness the metal in the interior will be little affected. It is also evident that for very irregular shapes the process is not applicable. For cylindrical pieces and especially for hollow cylinders, it is a most beneficial operation. A coarse, crystalline structure is readily changed to a fine, homogeneous quality. The most marked effect of oil tempering and annealing on steel is the raising of the elastic limit. This is accompanied by a moderate gain in tensile strength and a slight loss in ductility; but both these results are secondary in importance and amount to the effect on the elastic limit. "Gain" and "loss" above are taken with reference to the same steel thoroughly annealed, but not oil tempered, and also it is to be noted that oil tempering should, except in particular cases, be followed by annealing.

The application of this treatment is now universally adopted for gun forgings, and has extended from that to large shafting and similar work, and is now also used for armor plate. The details of tempering, whether double or single, at what temperature, &c., depend on circumstances. In general, the plant necessary consists of a furnace for heating, capable of giving the forging a high uniform temperature, a tank of oil, and proper hoisting and conveying machinery to pass the work quickly from the furnace to the tank. It is to be noted that the heating in this case is of an intermittent character, and the furnace will be designed with that in view. Oil tempering opens the way for a bad practice, which is not always avoided as it should be, and, in fact, is not always recognized as such. We refer to the selection of a very soft steel for the forging and tempering up to fill specifications. This is sometimes carried to such an extent that the final annealing is so slight as to be a farce. While oil tempering benefits the metal it leaves it with considerable internal stress, which should be relieved by an effective annealing. At the outset, therefore, a sufficiently high grade of steel should be selected to permit of thorough final annealing.

### Trade Publications.

AN INTERESTING CATALOGUE issued by the California Wire Works of San Francisco is devoted principally to illustrating and describing the different forms, applications and parts of the Hallidie patent wire ropeway. The matter deals with the transportation of ore and other material by means of an endless traveling wire rope. The engravings show the many and widely varying situations where this method is particularly applicable. The essential feature of this system has been and is a single moving rope with a fixed clip or carrier attachment, and from this feature it is stated there has been no good reason to depart during the 23 years it has been in operation. We quote as follows: "There has been no case of failure in working to the satisfaction of the owners wherever a line of ropeway has been constructed by intelligent mechanics in accordance with our instructions or under the direction of our engineers."

WE HAVE RECEIVED from the Geo. Burnham Company of Worcester, Mass., an illustrated catalogue of their hand and power upright drills for blacksmiths, carriage makers and light machinists. The two and three spindle drills are new. In the former the spindles are 10 inches apart, and each will drill a  $\frac{3}{8}$ -inch hole and under to the center of a 16-inch circle. In the latter the spindles are 10 inches apart and the two outside ones will drill to the center of a 22-inch circle, the middle one drilling to the center of a 13-inch circle.

Three of the seven miners on trial for burning coal tipples and placing explosives beneath buildings during the Pennsylvania miners' strike last June were sentenced by Judge Mayer last week, on one charge of their indictment, to pay a fine of \$1 and costs of prosecution and to undergo an imprisonment of seven years in the Allegheny Penitentiary at solitary confinement and hard labor. Two others were sentenced to five years imprisonment and a similar fine, while the remaining two, who pleaded guilty to placing gunpowder beneath buildings, were awarded three years imprisonment in the State's prison at hard labor and solitary confinement, on the one charge. All these men have further indictments hanging over them, under which they may be sentenced should they again commit themselves in a similar manner.

### Duluth News.

A number of questions that will be of the greatest interest to the mining men of the State of Minnesota will come up at the session of the State Legislature that will open the first week in January. The State royalty of 25 cents a ton on ore mined on lands owned by the commonwealth is claimed by the mining men to be too high, and they will make an attempt to reduce it. This they will do by a sliding scale, the royalty being fixed at 10 or 15 cents at the present price of ore, increasing as the price advances to the normal. They will also, as an inducement for the State to grant what they ask, agree that no mine on which a minimum of 100,000 tons is not mined yearly shall be entitled to the reduction. At present the mines under State leases can be held 50 years by the payment of a flat royalty of 25 cents on 3000 tons annually.

Papers are being made ready to serve on the State railroad and warehouse commission demanding an inquiry into the rates charged by the railroads for hauling ore to the lake at Duluth, with a view to their reduction from 80 to 50 cents. It is claimed by the mining men that 30 cents amply covers the cost of transporting this ore. Under the State laws the State board has full power to regulate excessive charges on roads entirely within the borders of the State, as these roads are, and it is stated that the board is at the present time favorably disposed to the proposed reduction.

Another matter that is to come up is one that was to have been agitated at the session held two years ago, but for some reason was laid over. This is the passage of a law rebating all State royalty on ore mined on State lands that is smelted within the confines of the State. The argument is that there would be more benefit to the State as a whole by the market that would be created for the farmers and manufacturers of the State by the building up of a great iron and steel center, than would come from the 25 cents derived by the royalty, and the ore be allowed to be shipped to the Eastern furnaces. In view of the present conditions it is not at all improbable that such a proposition would meet with favor.

Upper lake navigation is open late this year, notwithstanding an excessively cold November, and the last vessels out of Lake Superior will not leave Duluth till about December 7. Ore shipping was closed last week, the last vessel leaving Ashland the 26th, Duluth the 23d and Two Harbors the 28th. From Marquette the last was on the 27th. Escanaba is shipping a little this week. The totals from the various ports are as follows: Escanaba, 1,550,000 tons, of which 1,000,000 were from the Menominees, 500,000 from the Marquette and 50,000 from the Gogebic; Marquette, 1,400,000 tons from the Marquette range; Ashland, 1,710,000 tons from the Gogebic; Duluth, 1,250,000 tons from the Mesabi range; and Two Harbors, 1,370,000 tons, 960,000 from the Vermilion and 410,000 from the Mesabi. The largest individual production has been, of course, that of the Minnesota Iron Company and their subsidiaries, with a total output of 1,310,000 tons, while next to it is the Norrie group with 826,000 tons; next the Penokee & Gogebic consolidated with 670,000; next the Mountain Iron 575,000 and the Oliver 510,000 tons.



## MANUFACTURING.

### Iron and Steel.

It is announced that the plant of the Wellman Iron & Steel Company, formerly known as Chester Rolling Mills, at Chester, Pa., will be sold on Saturday, the 15th inst., or during the 30 days following that date. Attorneys representing creditors to the amount of \$450,000 were present in court on November 17, when the decree was made, and offered some suggestions looking to the starting up of the plant by a company which is ready to operate it. It was stated that arrangements had been completed for putting \$170,000 of new money into the plant, and paying the unsecured creditors in preferred stock. If the arrangements were completed \$20,000 would be paid to secure the interest on the company's bonded debt.

The Stickney Iron Company of Baltimore, Md., are now dismantling Furnace A, which has not been in blast for several years and which will not be rebuilt. The company will continue to operate Furnace B, the product being charcoal pig iron for malleable iron castings and car wheels.

The dismantling of portions of the plant of the Johnson Company, Johnstown, Pa., has been commenced, and several carloads of material have already been sent to the location of the new plant at Lorain, Ohio. Thus far only such portions of the equipment as could be spared have been sent away. Other portions will be removed as soon as present contracts are filled.

The Pennsylvania Steel Company, Steelton, Pa., will make some important changes in their Bessemer, rail and blooming mills. An electric crane is to be built in the Bessemer mill to handle the ladles and molds. At No. 2 blooming mill a change is to be made so that the molds filled with molten steel will be taken to this mill from the Bessemer and emptied directly at the mouth of the heating furnaces. This change, with the new crane at the Bessemer mill, will do away entirely with the pitman force of 45 men at the Bessemer mill. A new table is to be put in at the rail mill rolls, which will displace a number of men. The men thrown out of employment by these changes will be distributed among the other mills.

In answer to the report that the Spearman Iron Company, Sharpsville, Pa., would erect a new furnace, we are officially advised that while the erection of a new stack was talked of some time ago, the intention being to tear down one of the stacks of this concern and erect a larger one to take its place, the matter has been indefinitely postponed and nothing will be done until about the middle of next year, if then.

On the authority of Wm. H. Baldwin, secretary of the Ohio Steel Company, Youngstown, Ohio, we can state that the report that a number of rail straighteners, formerly employed in the Edgar Thomson Steel Works, Bessemer, Pa., and who were discharged for going out on strike, had been given employment by the Ohio Steel Company, is without foundation.

The Belmont plate mill of the Wheeling Steel & Iron Company, Wheeling, W. Va., has been changed into a skelp mill. Should business justify it, the new department will be put on double turn within a short time.

We are officially advised that the statement that the Riverside Iron Works, Wheeling, W. Va., would engage in the manufacture of shovels, hoes and other agricultural implements is without foundation.

The Dry Dock Iron Company of Bay City, Mich., are about to add to their works a complete steel casting plant.

A movement is on foot to transfer the works of the West Superior Iron & Steel Company, at West Superior, Wis., to the Great Northern Railway Company for use as general shops for the manufacture of railroad material and repair work.

The Muncie Iron & Steel Company of Muncie, Ind., are about to enlarge their plant, although it is but a short time since the works were started. They are erecting a building 60 x 130 feet, to contain a puddle mill with four puddling furnaces.

Important changes are about to be made in the merchant mill of the Illinois Steel Company, at Milwaukee. So far as the plans have been made public, they seem to contemplate the remodeling of the plant to secure a greater output without compelling the employment of a larger force of workmen.

A charter has been issued to the A. & P. Roberts Company of Philadelphia. The capital stock is \$1,000,000. Of the 10,000 shares of stock subscribed all but four are credited to Percival Roberts. Of these shares 9000 have been issued to him as full paid in consideration of the conveyance by him to the company of the Supplee farm of over 56 acres in Lower Merion township, Montgomery County; the Pencoyd Iron Works, covering about 55 acres; the Henderson farm, containing over 78 acres, and several properties in Philadelphia. The directors are Percival Roberts, Percival Roberts, Jr., and P. Williamson Roberts.

The proposition made to the Chamber of Commerce of Salt Lake City, Utah, by A. Evans, Jr., to erect a blast furnace, pipe foundry, mills and other necessary adjuncts, involving an expenditure of \$150,000, upon the city guaranteeing him a bonus of \$25,000, has been accepted.

The Union Trust Company of Indianapolis have sold the plants of the New Albany Rail Mill Company, in New Albany and Alexandria, Ind., to a number of capitalists of St. Louis, Mo., the consideration being \$75,000 cash. The plant in New Albany, which has not been in operation for the past year, will be moved to Alexandria, and consolidated with a mill now located in Illinois, near St. Louis. No definite disposition has been made of the sheet mill.

The furnaces of the Coplay Iron Company, at Coplay, Pa., may resume blast at an early date.

The contract for rebuilding the portion of the McCullough Iron Works, at Northeast, Md., which was destroyed by fire several months ago, has been awarded. The building will be 129 x 80 feet and will cover the bar mill, sheet mill and engine room.

Copake charcoal furnace, in Columbia County, N. Y., will resume blast about January 1. The furnace went out of blast August 10.

We are advised that the statement that the Burgess Steel & Iron Works, Portsmouth, Ohio, had put their plant in full operation is hardly warranted by the facts in the case. The plant of this concern is now being operated to the extent that only 50 per cent. of the capacity of the plant is being turned out.

The Ashland Coal & Iron Company of Ashland, Ky., have leased the blast furnace of the Morton Iron Works, situated at Ashland.

As the time approaches for the annual settlement of the wage scale at the Homestead Steel Works, Homestead, Pa., reports are being circulated that material reductions in the wages of tonnage men are contemplated. In answer to these reports, the following authoritative statement has been given out: Owing to improvements in machinery, appliances and methods, and the consequent increase of tonnage to follow, a readjustment of the Homestead scale was necessary. A reduction in actual earnings is not contemplated, and any that might eventuate after the readjustment is in force would be very immaterial. In making the new scale the rates will be based on a demonstration of the actual performances of the machinery and appliances, and no guess work as to output will be indulged in. In connection with the above, it is stated on good authority that the wages of laborers in the Homestead Steel Works will be advanced from \$1.20 per day of 12 hours, the present rate, to either \$1.30 or \$1.50 per day.

Four diplomas from the managers of the World's Fair at Chicago have been received by employees of the Andrews Brothers Company, operating the Haselton Iron Works, Youngstown, Ohio. The diplomas were awarded to Jas. Ramsey, the 8-inch roller; John Conners, the 10-inch roller; William Pultney, the blast furnace foundryman, and James T. McKelvey, superintendent of mills. Ramsey, McKelvey and Conners were awarded diplomas on an exhibit of cold rolled iron and steel, and Mr. Pultney on an exhibit of Haselton American Scotch pig iron.

### Machinery.

The Water Committee of Allegheny City, Pa., met last week and opened bids for the pumps for the new water plant to be erected in that city. The specifications call for three vertical high pressure compound engines of 12,000,000 gallons each. There were seven bidders for the contract, as follows: Wm. Cramp & Son, Philadelphia, Pa., \$220,000; Holly Mfg. Company, Lockport, N. Y., \$185,785; Wilson-Snyder Mfg.

Company, Pittsburgh, Pa., \$231,990; Groshen & Co., New York City, \$177,000; E. P. Allis & Co., Milwaukee, Wis., \$180,000; H. R. Worthington, New York City, \$197,750; and Snow Pump Company, Buffalo, N. Y., \$198,000. E. P. Allis & Co. sent in an extra bid for triple expansion pumps which was not called for in the specifications and was consequently ruled out. It is probable that the contract will be given to Groshen & Co. of New York City, that concern being the lowest bidder. The pumps are required to have a pumping capacity of 12,000,000 gallons each per day or a combined capacity of 36,000,000 gallons.

A meeting of the business men of York, Pa., will be held during the present week for the purpose of perfecting plans whereby the plant of the National Lathe & Tool Company will be removed from Philadelphia and established in York.

The American Mining Machine Company of Pittsburgh have been granted a charter of incorporation, with a capital stock of \$10,000. The incorporators are: George Francis Meyers, Reed B. Coyle, A. C. Munhall, Louis L. Broughton, J. H. Palmer, all of Pittsburgh, Pa.

It is announced that the foundries at Portsmouth, Ohio, are now in full operation for the first time in two years.

Bids were opened at the Navy Department on November 26, 1894, for 100-ton shear legs for the League Island Navy Yard. The following is a list of the bidders: Wm. Sellers & Co., Philadelphia, Pa., \$25,150; Weimer Machine Works, Lebanon, Pa., \$27,986; Kilby Mfg. Company, Cleveland, Ohio, \$29,695; Forsaith Machine Company, Manchester, N. H., \$25,900; Philadelphia Engineering Works, Philadelphia, Pa., \$22,800; Tacony Iron & Metal Company, Tacony, Pa., \$21,990; Morgan Engineering Company, Alliance, Ohio, \$28,668; John Baizley Iron Works, Philadelphia, Pa., \$33,474; New Jersey Iron & Steel Company, Trenton, N. J., \$29,553; I. P. Morris Company, Philadelphia, Pa., \$27,675; A. H. Haig, Philadelphia, Pa., \$24,000; Maryland Steel Company, Baltimore, Md., \$34,200, and Camden Iron Works, Camden, N. J., \$28,870.

The J. R. Thomas Machine Company of Green Bay, Wis., are making rapid progress in the erection of their plant. They expect to be turning out completed machines for wood working by January 1 or shortly afterward.

The Aultman, Miller Company, at Akron, Ohio, have started their foundry with a full force of men, and it is expected that a start will soon be made in all the other departments.

The Memphis Car & Foundry Company, Memphis, Tenn., have completed their new works, which cover 50 acres of ground, and are now in active operation. Among other work they are rebuilding a large number of cars for the Kansas City, Fort Scott & Memphis Railroad.

Lincoln & Jewett's foundry, at South Boston, Mass., was destroyed by fire on the 3d inst.

The foundry and pattern shop of the Pullman Palace Car Company, Pullman, Ill., have been damaged \$25,000 by fire.

The Bass Foundry & Machine Works, Fort Wayne, Ind., have just furnished to the New Castle Wire Nail Company, New Castle, Pa., what is probably the largest driving or fly wheel in the country of its particular type. It is a rope transmission wheel, 25 feet in diameter, grooved for 33 2 inch ropes. It is constructed of three separate wheels, bolted side by side on the same shaft, each wheel being cast in halves, making but six castings in the entire wheel. The aggregate weight of these six castings in the rough was 120 tons. The engine for driving this fly wheel is one of the largest of its kind in the country, if not the largest, being a 36 x 70 x 60 tandem compound Corliss, to be run condensing. It is of massive construction and contains many new features that will no doubt prove of interest to mechanical engineers and others interested.

### Hardware.

Landers, Frary & Clark, New Britain, Conn., have purchased the plant of the Putnam Cutlery Works.

The Conover Fireplace Mfg. Company, New York City, have been incorporated for the manufacture of fireplaces, grates, fenders, mantels, &c. The capital is \$50,000. The directors of the company are A. E. Conover, W. E. Conover, C. J. Couter, A. R. Gulick and others.

J. L. Prescott & Co., manufacturers of blacking and polish at North Berwick, N. J., have decided to remove to Passaic.

It is reported that a company of Indianapolis capitalists are figuring on purchasing the Hazen wire nail works at Anderson, Ind., and building an iron mill in connection with them. The plant has been shut down for some time.

The Allerton Lubricant Company, Chicago, Ill., have recently been incorporated with a capital of \$3,000,000. Their works are at Grand Crossing. The Allerton-Clarke Company, 83 Reade street, New York, and 23 Lake street, Chicago, are sole agents for the company.

Walden Knife Company are enlarging their plant at Walden, N. Y.

The F. H. Rundell Mfg. Company, makers of hardware specialties, Corning, N. Y., are about to commence the erection of a new factory.

The Armourdale Mfg. Company of Kansas City, Kan., have filed articles of incorporation. The purpose of the organization is to engage in the manufacture of farm machinery and farm and household supplies, and to sell the same at wholesale and retail, the business to be conducted at Armourdale, Kansas City, Kan., and Kansas City, Mo. Capital stock, \$25,000. Directors: Gus. P. Marty, J. W. Martin, H. Lithgow and W. J. Hollis of Kansas City, Mo.; John A. Hale, C. P. Craig and Frank Mapes of Kansas City, Kan. Manufacturing operations will begin with a patented barb wire fence.

Berger Bros., Philadelphia, report that business with them is very satisfactory and that their trade is rapidly increasing. As evidence of this they have just secured the five-story building 231 Arch street, in their city, which they will use especially for the roofing supply department. They are stocking it with gutter pipe, sheet iron, corrugated iron and siding, and the other bulky goods characteristic of their line. The arrangement of the building is first-class and the facilities afforded for receiving and shipping goods are admirable, and conduce not a little to the attainment of a lead in bottom prices. The recent four-story addition to their main building has proved altogether inadequate to the requirements of their business, and it is in keeping with the firm's enterprise that they should have been compelled to seek further accommodation for their stock. Their patented gutter hangers are a prominent feature of their business, and the production of these goods, with their large line of tinners' hardware and specialties, furnishes employment for upward of a hundred molders.

The works of the Warren Axe & Tool Company, at Warren, Pa., have been destroyed by fire.

#### Miscellaneous.

The employees of the nut and bolt department of the Indiana Iron Works, formerly of Toledo, Ohio, but now located at Muncie, Ind., are on strike against a 15 per cent. reduction in wages.

It is announced that Wm. N. Whitely has decided to rebuild his reaper works at Muncie, Ind. The main structure will be 285 x 80 feet in size, with an addition of the same size at either end, forming a double L.

The Nut & Washer Mfg. Company of Milwaukee, Wis., announce that their new works are now in running order.

It is stated that every plant in the city of Anderson, Ind., with the exception of the Hazen Wire Nail Works, is running full blast, and many of them both night and day.

It is announced that the contract for rebuilding that part of the Bath, Maine, Iron Works which was recently burned has been awarded. This would seem to indicate that a removal to New London, Conn., is no longer under consideration.

The Allerton Lubricant Company of Chicago, Ill., have recently been incorporated with a capital of \$3,000,000. Their works are at Grand Crossing, Chicago. The Allerton, Clarke Company of 83 Reade street, New York, and 23 Lake street, Chicago, are the agents.

The Penn Bridge Company of Beaver Falls, Pa., have the contract for the erection of an iron and steel building, 60 x 280 feet, for the Union Iron & Steel Company, Youngstown, Ohio.

The handsome offices of the Aetna Standard Iron & Steel Works, at Bellaire, Ohio, have been burned.

#### The Development of Steam Power at Minneapolis.

The flour mills of the city of Minneapolis have a total capacity for the manufacture of 48,200 barrels per 24 hours, and though they were all located at their present site by reason of the falls of the Mississippi there are but two of them without auxiliary steam power equal, in nearly every case, to the machinery capacity of the mill. The water power of the river at the falls is available for the manufactories for about two-thirds of the year, and for the rest of the time they must depend on steam or close. The water companies have on the east side of the river 66 mill powers or 4950 horse-power, and on the west side 199 mill powers or 15,113 horse-power, a total of 20,063 horse-power.

This amount, it is claimed, can be largely increased by putting in reservoirs at the headwaters of the river and by the economical use of the power that is now sent over the wheels, though a great advance has been made in this latter direction the past year. In many cases the wheels are so fitted and so arranged as to size of draft tubes, &c., that much less than the theoretical power is obtained. For this reason the actual effective horse-power is from 65 to 70 to the mill power, making the total considerably less than the theoretical. The total fall on land owned as an appurtenance to the power companies is about 70 feet, while the fall on the water used does not exceed, on the average, 45 feet. Bonds are, however, being negotiated in England for the building of a new dam that will utilize the entire power.

The drainage area on the river above the fall is 20,000 square miles, and the average annual rainfall is 30 inches. The lumbermen who operate at Minneapolis and at points on the river above that city have been in the habit of erecting dams that hold the water in its lowest stages during the winter, and let it go at the very time when it is least necessary, in the early spring, these dams and floods being for the purpose of holding and floating their logs to the mills. The Government, too, in its attempts to make more certain the navigation of the river, has built immense dams on the upper river which hold the water in the winter and fall and let it free during the summer months. This does good, for the water is sometimes so low in the summer as to necessitate reliance by the mills on the Government's floods. This was shown during the past summer, when after a season of dry weather such as had never been known, the dams were opened and the river was made navigable for logs and steamers, the effect of the floods being noted as far as the lower Iowa line. All the mills had been using steam, the bed of the river had been almost completely dry, and the change was startling.

The two water power companies, which are controlled by identical interests, are now engaged on a work that is expected to give better water, and make more durable the falls, the continued existence of which has been threatened for years. This work is to cost \$70,000 and is to be completed in a few weeks. The original works for the preservation of the falls were built by the city and the general Government, after there had been such tampering with the soft sand-rock underlying the limestone bed of the stream at that point that the falls were receding at the rate of considerably over 100 feet per year. The geological formation is St. Peter sandstone capped by

Trenton limestone, but the upper limit of the limestone is but 300 or 400 feet above the crest of the falls, and the sandstone is so soft that it is cut by the action of the water like so much sand. The limestone lies in horizontal strata, and at the fall is some 14 feet thick. The original preservative works, of which much has been written, cost \$900,000, and put the falls in such condition as to do away with immediate danger of their further recession. They have been, however, far from as permanent as they should be, and the new works have done away with the main difficulty, that of the wearing away of the sandstone below the fall by the rush of the confined water that came over the apron in a sheet only 450 feet wide at the crest and 100 feet less in width at the bottom. Holes to the depth of 40 feet have lately been found in the sandstone, extending up under the limestone forming the fall itself, and which could but cause serious disaster or complete ruin at no distant day.

Water is sold to the consumers at \$1000 per year per mill power, and whatever surplus there may be at certain times of the year is disposed of at \$5 per day per power. These prices are far more than was charged for permanent powers at the earlier stages of the improvement, with the result that the priority of leases cuts a very great figure in the value of powers.

While there are, as above stated, auxiliary steam plants in nearly all the mills, these plants, with one exception, consist of horizontal simple and compound engines and ordinary boilers. A good quality of steam coal usually costs, delivered at these mills, not less than \$4 50 a ton. The Pillsbury "A" mill, with a capacity of nearly 7000 barrels daily, and using 40 mill powers of water, has cross compound engines and ordinary boilers. In the C. C. Washburn mill "A" there has just been put an excellent steam plant, modern in all its appointments, under plans of W. de la Barre, engineer of the water power companies. This consists of a triple expansion, vertical, marine type engine, built by Schichau of Elbing, Prussia, and on exhibit at the World's Fair, together with Butman furnaces and Heine safety boilers. The engine is of 27½-inch stroke, and its cylinder diameters are respectively 22.86, 37.40 and 57.08 inches. A steam pressure of 180 pounds is maintained, and the plant will generate about 1500 horse power. The official working, not expert, test of this plant, made recently, shows the boilers to have evaporated 9.07 pounds of water per pound of fuel, actual conditions; pounds of fuel per horse-power, 3.37; pounds of coal per barrel of flour, 13; steam consumption per horse-power per hour, 14.4 pounds.

It is stated that the average cost of power for the manufacture of a barrel of flour, not including interest or depreciation of plant, is 2½ cents by water and from 6 to 7 cents by steam. It will be interesting to note whether the experiment of more economical steam power will reduce this latter cost to a point that will warrant its further introduction. As a mere matter of comparison it may be stated that the cost of power at the mills at Duluth, where steam is exclusively used and where there are some excellent power plants, is 2½ to 3½ cents a barrel, figured on the same basis, coal used there being the refuse from the docks. Besides the flour mills, the city water works and a number of other mills using water power have auxiliary steam power to the full capacity of the plants.

## The Iron and Metal Trades.

Very conflicting accounts are rendered as to the condition of the Iron trade. Some manufacturers and merchants have drifted into a frame of mind which may be characterized as hopeless resignation. Others see daylight ahead, but frankly admit that they are thinking rather of the volume of business than of prices.

Chicago is encouraged by the appearance of some car orders, and the suggestion is thrown out that some buyers are going about their purchases in a very secretive way, in order not to raise the market on themselves. The feeling among buyers is, however, that they have nothing to fear from any influences adverse to them until well into spring.

Work is coming out in a spasmodic way, and that may account for the wide variations in opinion.

The assertions current last week that Steel Billets had sold at prices equivalent to \$15, Pittsburgh, are vigorously and unanimously denied by makers in that city. It is certain that sales between mills in that district have since then been made on the basis of \$15.25 at sellers' mills, which proves that the manufacturers themselves did not make the reported sales. It is assumed that they must have been short sales on the part of outsiders. Wire Rods are easier, \$21.75 having been quoted at the West.

The movement in Bessemer Pig has been light. There seems to be some product for the first quarter of 1895 disengaged, since Valley Iron has been offered in Eastern Pennsylvania at \$9.60, at furnace, for a good sized block.

No business of any consequence has yet been done in Steel Rails for 1895, although negotiations are pending for some round lots, which will be closed at an early date.

The attempt to revive the short lived Barb Wire pool by increasing the penalty to \$5  $\frac{1}{2}$  ton, far exceeding allotment, has failed. The refusal to base the percentage claimed by a new works upon its capacity was the cause of the rupture.

In Foundry Iron the most important development is the withdrawal on the part of local makers of low quotations in the Chicago market. On the other hand, outside producers are pressing in Pittsburgh, and very low prices have been made by Virginia and Alabama furnaces in New England.

Tin has continued to decline and has now reached 13.50¢, thus showing that the campaign of the London Tin king against the syndicate is progressing favorably. Copper and Lead are quiet, with sales of foreign Lead recorded at 3.10¢. The market for Tin Plate is without spirit and tends to favor buyers, in spite of the troubles in the American mills.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., December 4, 1894.

Business in Iron and Steel has not shown much change of late, and from present appearances is not likely to change until things get fairly under way for 1895. Nothing unfavorable has developed recently; but with so many ready to take orders for anything and everything at the lowest figures ever quoted, it seems impossible to secure a firm market. Prices are not quotably lower than they were a week ago, but the turn is in buyers' favor, and, with considerable pressure to sell, the immediate outlook as regards prices is not encouraging. The volume of business is maintained, and anything bought is wanted for immediate delivery, showing that consumers are all bare of stock and that they cannot stay out of the market except for a very brief period. The week or two of holidays is figured on as likely to help buyers to get in at low prices for the first quarter of the new year, and, from the anxiety of sellers to secure business, it is not unlikely that they (the buyers) may succeed temporarily. There is a very strong belief in higher prices some time during the early portion of '95; but the remainder of '94, and perhaps a few weeks later than that, will be a trying time, and, until there is some actual movement as the result of increased requirements, buyers are hardly likely to abandon their policy of taking none but small lots to cover immediate necessities.

**Pig Iron.**—The market is extremely dull, although deliveries are still called for with considerable urgency, indicating that consumption is well maintained, and that yards are somewhat bare of stock. New business is not large, however, there being a general disposition to await developments before entering into new engagements of any magnitude. There is more pressure to sell than there was some time ago, and while prices are not lower the feeling is heavy, and it is just possible that somewhat lower figures may be made before there is anything like general activity. Prices are so low that there is no room for much of a decline, and as a matter of fact no one expects any decline, but on the other hand, buyers are unwilling to tie themselves to heavy engagements until they see some definite prospect of a better market than is warranted by the immediate outlook. Business, therefore, is mostly of a hand-to-mouth character, although in some cases sales have been made for deliveries covering the first three months of '95, and at about the same quotations as for spot lots. General quotations for Philadelphia and nearby points are about as follows, and for deliveries within a radius of 100 miles South or West 20¢ @ 30¢ less:

Bessemer.....	\$12.50 @ \$12.75
Standard No. 1 Foundry X.....	12.50 @ 13.00
Standard No. 2 Foundry X.....	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	@ 10.25

**Steel Billets.**—The demand is not active, but a few good sized lots have been taken at a figure slightly below \$17.75, which is the usual asking price. Sellers talk firmer prices, but from the fact that bids of \$17.50 @ \$17.65 have been accepted for 1000-ton lots, the situation cannot be regarded as very strong, although several leading mills are said to be sold close up for several weeks to come.

**Finished Material.**—Business in this line is extremely dull, and, as a rule, mills are doing less than they were during November, with very little prospect of improvement until after the turn of the year. There are no inquiries of importance, and although there is a great deal of work in prospect, it is hardly likely to assume definite shape so as to be available until January or a later date. Prices are therefore extremely weak, and anything like fair sized orders are easily placed at concessions from quoted rates. The small trade are pretty constant buyers, and, in fact, mills in this vicinity seem to have little else to depend upon except the regular day to day demand. Nominal quotations are about as follows for small lots:

Grooved Skelp.....	1.20¢ @ 1.25¢
Standard Refined Bars.....	1.20¢ @ 1.25¢
Medium quality.....	1.10¢ @ 1.15¢
Tank Steel.....	1.30¢ @ 1.35¢
Heavy Plates.....	1.30¢ @ 1.40¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.40¢ @ 1.50¢
Beams and Channels.....	1.50¢ @ 1.60¢

**Old Material.**—The market is less active than for some time past, but as stocks are considerably reduced prices are maintained as follows:

Heavy Melting Steel.....	\$10.00 @ \$11.00
Light Melting Steel.....	8.00 @ 8.50
No. 1 Wrought Scrap.....	11.00 @ 11.50
Machinery Cast.....	9.00 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.25 @ 6.75
Old Iron Rails.....	12.00 @ 12.50
Old Car Wheels.....	10.00 @ 10.25
Old Iron Axles.....	15.50 @ 16.50

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 5, 1894.

A most hopeful feeling prevails throughout almost the entire trade and the only important element lacking to insure a large volume of business is the patronage of the railroad companies. Their trade has dwindled to very small proportions with the approaching close of the year. Purchasing agents have been ordered by their superiors to buy very sparingly this month. They state, however, that a heavy trade is to be expected from them after the new year opens, as a great deal of material is needed now and will be imperatively needed very shortly. While they are buying general supplies in this careful way, an indication crops up here and there of business of an important character now being quietly placed. One order for 500 freight cars was given last week to a local concern without soliciting bids from other establishments. Two or three smaller orders are also known to have been placed. The quiet purchase of cars in this way looks as though it were done so as not to create an advance in price, which might follow the general knowledge that railroads had begun largely to buy rolling stock. Inquiries from other classes of consumers are increasing for material to be delivered during the early months of next year. Orders from the Southwest are better than from any other section. Glowing reports are being received from Texas of the excellent condition of that part of the country and heavy purchases there of all classes of products. The burden of rumors and reports just now is certainly much more strongly in favor of a great increase in the volume of business than a diminution.

**Pig Iron.**—The local Coke Iron makers have withdrawn their lowest quotations and the market is now much firmer. Transactions of the past week were unexpectedly good, embracing several lots of 1000 to 2000 tons. The demand grows out of the improvement in general business, consumers finding their requirements running beyond anticipations and they are ordering larger monthly deliveries. The market for local Iron has also been considerably widened and shipments are now being regularly made to the territory bordering on the Ohio River. Southern Iron is in no better demand than before and prices are in the same condition of irregularity, the smaller companies making lower figures than the leading concerns. Lake Superior Charcoal is in moderate demand, but the quantity moving appears to be gradually increasing. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00	@	\$14.00
Local Coke Foundry, No. 1.....	10.25	@	10.50
Local Coke Foundry, No. 2.....	9.75	@	10.00
Local Coke Foundry, No. 3.....	9.50	@	9.75
Local Scotch.....	10.50	@	11.00
Ohio Strong Softeners No. 1.....	12.50	@	13.70
Southern Silvery, No. 1.....	11.50	@	11.75
Southern Silvery, No. 2.....	11.25	@	11.50
Southern Coke, No. 2.....	10.25	@	10.50
Southern Coke, No. 3.....	9.75	@	10.25
Southern, No. 1 Soft.....	10.25	@	10.50
Southern, No. 2 Soft.....	10.00	@	10.25
Alabama Car Wheel.....	17.50	@	18.00
Jackson County Silvery.....	15.50	@	16.00
Other Ohio Silvery.....	14.25	@	14.50
Coke Bessemer.....	11.00	@	11.50
Coke Malleable.....	11.00	@	11.50
Spiegeleisen 20%.....	...	@	26.00

**Bars.**—The car trade is picking up. One order has been placed for 1500 cars, another is on the market for 750 and several smaller orders have gone into the hands of manufacturers, while rumors are current of more to follow. These must result in good orders for Bars, Axles, &c. The general demand for Bar Iron is fair, although the inventory season is approaching, which affects the business of important classes of buyers. A firmer tone is perceptible, but general quotations on mill shipments of Common Iron stand at 1.05¢ @ 1.10¢, Chicago; Guaranteed Iron, 1.15¢ @ 1.20¢, and Soft Steel Bars from strictly Billet stock, 1.20¢ @ 1.25¢. Jobbers in some cases report a large demand, consisting of an aggregation of orders for small lots, but others report a decreased business from that of last week, probably owing to handling a different class of trade. Small lots from stock are a little firmer, and Bars are now quoted at 1.20¢ upward for Iron and 1.30¢ upward for Soft Steel.

**Structural Material.**—The largest order of the week was one for about 250 tons of Beams. Small orders for Building Shapes and Bridge Material continue to come in steadily and the outlook is improving a little as compared with past weeks. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.85¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

**Plates.**—The most serious complaint is heard about prices on all classes of Plates. A great deal of business is being transacted, but it is being taken by manufacturers who are willing to considerably shade the general prices quoted here, and will handle almost any quantity, even though it is considerably less than a carload. This demoralizes store business as well as the mill trade. It is reported that some figuring is now being done on a large Steel boat, with the expectation that it will be built at the local shipyard.

We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75 % off.

**Sheets.**—Trade continues quiet in both Black and Galvanized Sheets, although in some directions a disposition to contract for future delivery is reported. Mill shipments are quoted at 2.30¢ @ 2.35¢, Chicago, for No. 27 Common Black, 2.40¢ @ 2.45¢ for Steel Sheets, and 80 % @ 80 and 2½ % off for Galvanized Sheets. Sheet Copper sells at 14¢ base to 14¢ less 10 %. Small lots are quoted at 2.40¢ @ 2.50¢ for No. 27 Common, and 75 and 10 % off for Galvanized.

**Merchant Steel.**—Business is comparatively quiet, although much better than last year at this time. Season buying is now about over, but orders for small lots are coming in from consumers who need more than their contracts called for. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

**Billets and Wire Rods.**—The local trade is now affected by the low prices quoted from the East. Consumers expect such prices to be met, but manufacturers here refuse to do so. Quotations are therefore maintained at \$17 for Billets and \$23.50 for Rods. The Chicago manufacturers propose to pursue a waiting policy, as they are well fixed for the first quarter of next year and can afford to take a little chance on the future.

**Rails and Track Supplies.**—A few thousand tons of standard Rails have been sold for January and February delivery, but large orders are slow to develop into actual business. A much heavier tonnage than that of the expiring year is looked for, as large railroad systems bought sparingly and some of them not at all, and they must buy for extensive renewals in 1895. Quotations are maintained at \$25 for this year, although \$23 is the figure for 1895 delivery. Quotations are continued as follows: Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.60¢ @ 1.70¢; Links and Pins, 1.60¢ @ 1.70¢.

**Old Rails and Car Wheels.**—Small lots of Old Iron Rails have been sold at \$10.50. Holders are offering a considerable quantity on the market, but dealers and consumers are not disposed to make heavy investments at present. Old Steel Rails are still quoted at \$7 @ \$9, according to length and condition. Choice lots bring \$10. A lot of 8000 tons of Old Steel Street Rails is to be sold this week. Old Car Wheels are very quiet, with large offerings. Nominal quotations are continued at \$9 @ \$9.25 in the absence of actual business, but buyers are bidding considerably under the lowest figure.

**Scrap.**—The effort by railroad companies to dispose of their holdings of Old Material the past week hardly resulted as anticipated. Considerably better prices were realized than dealers and consumers had expected. This condition of affairs was brought about by the heavy demand coming from very large consumers who turned up at an

opportune time. One concern is reported to have bought no less than 4000 tons of Wrought Scrap. A great deal of Cast and Cheap Scrap was sold at good prices. Meanwhile dealers quote the following selling prices @ net ton: Railroad Forge, \$8.50 @ \$9; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.75; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.25; Axle Turnings, \$6.25; Fish Plates, \$9.50; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

**Metals.**—Lake Copper is unchanged at 9½¢ for carload lots. Casting Copper continues to be quoted at 9.50¢ for Eastern standard brands, but Western is selling down to 9¢ for carloads, spot cash. Spelter is dull and weak, being quoted at 3.17½¢ @ 3.20¢. Pig Lead is quiet, but unchanged, at 2.95¢. Not much business is expected this month.

Forster, Hawes & Co., The Rookery, Chicago, announce that the demand for their Iroquois Pig Iron has become sufficiently great in Southern markets to warrant the establishment of a resident agency at Cincinnati. They have therefore appointed as their sales agents in that city Messrs. Mackay & Hooker, 163 West Second street. Iroquois Iron is now being shipped regularly to consumers in St. Louis and vicinity, and an opening has been made for business at Louisville.

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, December 5, 1894.

**Pig Iron.**—There is practically no demand. Sales during the last week were probably lighter than they have been at any period during the entire year. A few orders have been booked for delivery during 1895, and the readiness with which furnaces accept these orders would seem to indicate that they place little faith in any improvement in prices after the turn of the year. The policy of buying as their needs require is still followed by a large number of consumers, and as prices do not show any strength there is no good reason why they should not continue this policy. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.75	@	\$11.00
Southern Coke, No. 2 Foundry.....	9.75	@	10.00
Southern Coke, No. 3 Foundry.....	9.50	@	9.75
Southern Car Wheel.....	16.50	@	17.00
Gray Forge.....	9.00	@	9.25
Ohio Softeners.....	14.00	@	14.50

**Bar Iron.**—There is no change to note in Bar Iron. The demand is a trifle better, but prices remain as heretofore. Mills quote carload lots at 1¢ @ 1.05¢. Jobbers ask 1.10¢ @ 1.15¢ according to quantity.

**Barb Wire.**—The demand during the past week has been very unsatisfactory. There are practically no large orders in the market, and the small orders are few and far between. Painted is quoted in carload lots \$1.65; Galvanized, \$2.05.

**Wire Nails.**—The situation in the Wire Nail market is unchanged. Prices are weak and sales continue to show a falling off. Jobbers quote \$1.10 @ \$1.15.

**Rails and Track Supplies.**—The improvement noted in our last report con-



tinues and prices for Track Supplies are a trifle firmer and are quoted as follows: Splice Bars, 1.20¢ @ 1.25¢; Spikes, 1.60¢ @ 1.65¢; Bolts, Square Nuts, 1.75¢; with Hexagon Nuts, 1.85¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails are unchanged at \$26.50 @ \$27; Old Iron Rails are weaker at \$10 @ \$10.50.

**Pig Lead.**—There is nothing of interest to note in this department. At 2.85¢ there is nothing offered and sales are difficult to make at 2.90¢, so that a fair average would be 2.87½¢. The consumptive demand is light and shows no signs of immediate improvement.

**Spelter.**—The market is weak and unsettled at 3.10¢. Sales are confined principally to carload lots and consumers continue to purchase only as their immediate needs require.

## Pittsburgh

Office of *The Iron Age*, Hamilton Building, }  
PITTSBURGH, December 4, 1894. }

It is hardly necessary to state that the situation in the Iron and Steel trades is unchanged and presents no new features. As before stated, there will hardly be any improvement in the Iron trade before about February 1, next. The railroads, which are the great consumers of Iron and Steel, are not buying anything to speak of, but are getting ready to present their annual reports of the year's business to the stockholders next month, and as they naturally want to make as good a showing as possible, they are not buying anything. The same is true of other buyers, and the volume of business for this month will necessarily be very light.

**Pig Iron.**—The condition of the Pig Iron trade, both as regards demand and prices, is unsatisfactory and at the same time is puzzling. It is admitted on all sides that stocks of Iron are light, and while the demand is not heavy, prices are weak and are probably as low as ever before in the history of the trade. Both buyers and sellers of Pig Iron admit that there is no warrant for the present low prices, and it is the general opinion that a few purchases of round lots would soon bring about better prices. Indications point to a heavy consumption of Pig Iron next year, and it seems certain that prices cannot well go much lower, but should improve with a better demand. Already the output of several Valley stocks has been taken up to July 1 of next year, and they are out of the market as sellers. With the Ohio Steel Company using the product of at least four stacks, and the Lorain plant a probable consumer after April 1, a scarcity of Bessemer Pig before the middle of next year is not an impossibility. Of course additional capacity is in preparation, but with the exception of the new Bellaire stack, it will not be available before July 1, if then. During the week Bessemer Pig has sold at \$10.25, Pittsburgh, equal to \$9.60 at Valley Furnace. Gray Forge is weak at \$9.50, Pittsburgh, equal to \$9.85 Valley Furnace, but the supply is limited. Reports are going of some very low prices being made on Foundry Iron by furnaces in outside districts, and it is probable our quotations on both Nos. 1 and 2 could be shaded. We quote as follows:

Neutral Gray Forge.....	\$9.50 @	\$9.65	Cash,
All-Ore Mill.....	9.65 @	9.75	"
No. 1 Foundry.....	11.00 @	11.25	"
No. 2 Foundry.....	10.60 @	10.65	"
Bessemer.....	10.25 @	10.40	"

We note a sale of 2000 tons of Bessemer, equal deliveries in December and January, at \$10.25, Pittsburgh. Also a sale of 500 tons of Gray Forge at \$9.50, Pittsburgh.

**Ferromanganese.**—Quite a struggle for supremacy is going on between foreign and domestic and some low prices are being named. Foreign in bulk has been offered here at a shade over \$48, delivered at buyer's mill.

**Billets.**—The Steel market is quiet, the demand very light and prices are somewhat weaker. The market is disturbed to some extent by reported offers of brokers to sell in Eastern territory at prices considerably lower than are ruling for local trade. The claim is made that these offers, if they have actually been made, are by brokers and merchants who are selling short. Careful investigation here shows that the Steel market is correctly represented by the quotation of \$15.25 at maker's mill, and persistent attempts of buyers to shade this price have not been successful. The market is flooded with offers of \$15 for Steel for next year, but they are not being accepted. We note a sale of 1500 tons of Billets for December delivery at \$15.25 at maker's mill, and one of 600 tons for same delivery at same price.

**Steel Rails.**—The Rail agreement for 1895 is an assured fact, and the price for standard sections (45 lb and upward) has been fixed at \$22, Pittsburgh.

**Structural Material.**—No large orders have come up during the week, but a number of large contracts are in sight. A large tonnage will be required for the Soho Bridge taken by a local concern, but specifications have not yet been sent out. The outlook for steady work through the winter is promising. We continue former quotations, as follows: Beams and Channels up to 15-inch, in round lots, 1.20¢. For medium sized orders 1.25¢ @ 1.30¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.35¢ @ 1.45¢.

**Merchant Steel.**—The situation is considerably improved as regards volume of business, but prices continue very low. An order for about 100 tons of high grade Implement Steel was secured by a local mill last week. We quote as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.40¢ @ 1.50¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢. These prices are occasionally shaded for desirable orders.

**Plates.**—Orders are nearly altogether for small lots, and while aggregating a fair tonnage, are not sufficient to remove the sharp competition prevailing for so long. An Eastern mill is reported as having taken some orders for delivery in this district. We continue quotations as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

**Muck Bars.**—Nothing doing. We repeat nominal quotation of \$18.50 delivered.

**Bars.**—The improvement in orders, before referred to, continues, and still further improvement in this direction is expected after this month, when the railroads will have made their annual reports, and will probably begin to place their orders. The improvement in prices referred to last week has hardly been sustained, and for desirable specifications our quotations continue

to be shaded. We quote Common Iron Bars at 0.95¢ @ 1¢, and Steel Bars at 1¢ @ 1.05¢, with usual extras.

**Sheets.**—As stated last week mills are more eager for business and prices are a shade lower in consequence. We quote No. 27 Common Iron at 2.15¢ @ 2.20¢, and No. 27 Steel for 2.25¢ @ 2.30¢. Galvanized Sheets are ruling at 80 % off.

**Wire Rods.**—We continue quotation of \$22, Pittsburgh, for Wire Rods, but for competitive business this price has been shaded.

**Pipes and Tubes.**—The demand is only fair and some low prices are being made, especially on Boiler Tubes.

**Skelp Iron and Steel.**—We quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to width and order; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

**Wire Nails.**—December is recognized as the duldest month in the year in this trade and, as a consequence, the demand for Wire Nails is only moderate, but is as large as expected. We quote Wire Nails at 90¢ in carload lots for December delivery. For January delivery some makers ask an additional 5¢ per keg. Cut Nails are also light in demand and are ruling at 80¢ @ 85¢ for usual averages.

**Barb Wire.**—While the demand for Barb Wire for close delivery is light, manufacturers report the outlook for a heavy spring trade as very encouraging, and as a consequence are not disposed to book orders for next year at present low prices. We quote Four-Point Galvanized at \$1.90, in carload lots for close delivery, but this figure is occasionally slightly shaded. Plain Wire is ruling at \$1.20 @ \$1.25 in carload lots.

**Connellsville Coke.**—Manufacturers of Connellsville Coke still insist that higher prices should be obtained for their product for 1895, but as yet no feasible plan by which this can be accomplished has been formulated. A number of contracts for Coke for the first half of 1895 are in the market, and several are expected to be closed this week. As stated under this head last week, several contracts for the first quarter of 1895 have been closed at the old price of \$1 per ton, and at present there seems to be little or no difficulty in getting Coke at that price.

**Iron and Steel Scrap.**—Very little material is moving, and the demand will likely continue light during this month, as buyers will defer purchasing until after stock taking has been finished. We quote as follows: No. 1. R. R. Wrought Scrap, \$9.75 @ \$10, net ton; Railroad Cast Scrap, \$9, gross ton; Hammered Iron Car Axles, \$18 @ \$18.50, net ton; Rolled Iron Car Axles, \$15.50, net ton; Car Wheels, \$9 @ \$10, gross ton, according to quality; Old Iron Rails, \$12, gross ton; Old Steel Rails, 6 feet and over, \$11, gross ton; Short or mixed lengths for melting stock are very dull, and are freely offered at \$9, gross ton; Cast Iron Borings, \$5, gross ton; Steel Leaf Springs, \$11.50, gross ton, and Steel Coil Springs \$10.50, gross ton.

A. L. Butler, for 20 years at the head of the Chicago office of the Crescent Steel Company, has resigned on account of ill health. He goes to California for the winter. He is succeeded by Mr. H. H. Miner.



## New York.

Office of *The Iron Age*, 96-102 Reade street, {  
New York, December 5, 1894. }

**Pig Iron.**—A number of round sales have been made lately, but at very low prices. Included in them is one lot of 1200 tons to a local Architectural works and 1500 tons to a Troy stove foundry. There is a good deal of complaint of sharp cutting on the part of Virginia and Alabama furnaces in New England, and some talk of concessions on some of the Lehigh Valley brands. We quote \$12 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2; and \$10.50 @ \$11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at \$11.25 @ \$11.50 for No. 1; \$10.25 @ \$11 for No. 2; \$10 @ \$10.50 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

**Ferromanganese and Spiegeleisen.**—The market is dull at nominally \$47 @ \$49, tidewater, for 80 % Ferromanganese, and \$20 @ \$21 for 20 % Spiegeleisen, tidewater.

**Billets and Rods.**—Brokers are making very strong efforts to place orders for Western material in Eastern territory. We quote \$17.50 @ \$18 for domestic Billets and \$24.25 @ \$24.75 for Wire Rods, tidewater.

**Steel Rails.**—Negotiations are pending for some round lots for 1895 delivery by Eastern mills, but as yet nothing of magnitude has been closed. There are indications that there will be a very heavy demand for Girder Rails next season, and in a few isolated cases contracts for 1895 requirements have been closed. We quote Standard Rails at tidewater, \$22.75; Girder Rails, \$24 at mill. Relays have dropped and are now offering at \$14.

**Track Material.**—We quote as follows for small lots: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

**Manufactured Iron and Steel.**—A disposition on the part of some buyers is noted to cover requirements for a considerable period of next year, but prices named by the mills are still a little too high. It is reported that the material for the new hotel at Forty-second street and Madison avenue has been closed. A good deal of work is coming up and is in sight. Among the larger buildings will be the Woman's Hospital and the new structure for the Young Men's Christian Association. We note also a sale of 500 tons of Bolt iron, New England delivery. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.20¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.20¢ @ 1.40¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.50¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.15¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.15¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.25¢ @ 1.50¢, delivered; Steel Axles, 1.25¢ @ 1.50¢, and Links and Pins, 1.35¢ @ 1.50¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Cotton Ties, 67¢ @ 75¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.25¢ @ 1.30¢, and Spring, 1.65¢ @ 1.70¢, delivered.

**Stock Warrants.**—The American Pig Iron Storage Warrant Company report as follows:

Stock in yard October 31, 1894.....	Tons.
Put in yard for 30 days, ending November 30, 1894.....	100,700
Withdrawn 30 days, ending November 30, 1894.....	1,800
Total.....	102,000
Withdrawn 30 days, ending November 30, 1894.....	1,000
Net stock in yard November 30, 1894.....	101,000

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts. {  
CINCINNATI, December 5, 1894. }

**Pig Iron.**—For a few days subsequent to our last review there was some further activity in the market for Southern Pig Iron, with several sales of 1000 and 500 ton lots of Foundry grades, but since that time, and especially since the opening of the month of December, there has been a lack of animation, although there have been a fair number of small orders booked at previously current prices. The most encouraging feature has been the business contemplated through the placing of orders for rolling stock by railroad companies, but up to the present time the contracts for cars placed have been small. At the moment it is reported that one transportation company is seeking favorable terms before completing a contract for 250 cars, and negotiations are now in progress with this end in view. There is still some complaint regarding the trouble arising from tardy deliveries by the railroads, with a sentiment that the roads should be touched up. But this feature of the trade, while aggravating, is a natural sequence to the conditions which have prevailed all summer, and time is a necessary element to adjust the roads to changed conditions. One fact which is dwelt upon with reassurance by agents is that the furnaces now in blast in the South are consuming about all the Ore and Coal being mined in that section of the country, and further, that any increase in the furnace capacity would require increased Ore and Coal production, which is impossible without the expenditure of considerable money and the lapse of many months, during which time the market would be strengthened by the relative increase of demand over supply. Another encouraging feature is that one of the largest Southern companies sold last month about 10,000 tons more Iron than it turned out. There is a moderate but steady consumptive demand for inquiry for Bessemer Iron here, and there have been small sales of Charcoal Iron, too, as well as Coke of Northern output, and a better demand for Virginia grades. Prices of all grades are without quotable change. Quotations are as follows:

### Foundry.

Southern Coke, No. 1.....	\$10.00 @ \$10.25
Southern Coke, No. 2.....	9.25 @ ....
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.00
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.00 @ 12.50
Lake Superior Coke, No. 2.....	11.00 @ 11.50
Hanging Rock Charcoal, No. 1..	16.00 @ 16.50
Hanging Rock Charcoal, No. 2..	15.50 @ 16.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Bessemer.....	11.65 @ 12.00

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @ 16.75
Lake Superior Car Wheel and Malleable.....	14.25 @ 14.75

### Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

## Birmingham.

BIRMINGHAM, ALA., December 3, 1894.

A better feeling seems to prevail, with less nervousness than heretofore noticed. There has been no tendency to weaken in any lines, neither is any improvement visible, except in quantity of sales, which is increasing. The bear movement inaugurated a few weeks ago has about spent itself to all appearances. Sales in all lines are still from hand to mouth, few long time sales being recorded. The car question is by no means relieved, and many complaints are made as to the delays caused by scarcity in this line.

**Pig Iron.**—Sales are reported as numerous, in fact some fair sized orders have been turned down, owing to demand to shade prices, while outputs were covered by sales already made. There has been an encouraging increase in this respect. Prices are firm, and little shading is reported. Some good sized orders of 1000 tons each are reported at firm prices; those were for Nos. 1 and 2 Foundry and Gray Forge. The demand is very general in grades, the higher grades, in fact, showing a gratifying demand. While sales are fully up to and in some cases above output, yet an accumulation of stock is noticeable, owing in a great measure to scarcity of cars. One company reports 46,000 tons sold last month, against a make of less than 40,000 tons, yet shows an increase in stocks. Quick delivery is demanded in many cases, even in large 1000 ton lots, showing a lack of supplies in hands of consumers. Collections are reported as very good, with little demand for time. Inquiry is decidedly stringent for delivery to cover 1895, but is meeting with no encouragement, few sales being reported beyond April. A sale of 1000 tons of No. 2 Foundry is reported to a local pipe works at ruling prices.

## Metal Market.

**Pig Tin.**—The reaction in prices that took place at the writing of our last review has given place to an almost uninterrupted downward movement. The change came gradually, as though regulated with a view to accomplishing certain purposes with as little disturbance as possible to the general trade. In other words, the "bear" interest appear to have worked with a view to worrying rather than vigorously forcing their opponents. That they succeeded is evidenced in the fact that prices have been carried down to 13.50¢ in the face of semi-official elucidation of the best points of the statistical position and a certain amount of resistance from operators who have ventured on the idea that a natural reaction is in order, no matter how large the stocks may be. That the generalship of the manoeuvres centers in London is morally certain. That the contest is largely between the leading London operator and former associates is quite probable. That the statistical position favors the former is clear. Whether the contest will be kept up until "8 pounds of Tin for the dollar" may be bought here is problematical, but the market has a very weakish appearance between the pressure of prominent operators and the weight of heavy supplies. At the close there were sellers of nearly all deliveries at 13.60¢, while 13.50¢ seemed to have been the best cash bid on round lots.

**Copper.**—Judging from the meager information imparted by producer's

agents, business has been moderate during the past week. The general statement was that no purchases have been made except of moderate sized lots needed to tide over immediate wants. The usual rumors are about the effect that contracts have been made for stock for delivery early next year, but the rumors go into no details as to amount of business or prices. Whether large contracts have been made or not it is clear that almost any variety of Copper may be purchased at the prices that ruled a week ago. Fair quotations are 9.50¢ for Lake Superior Ingot, 9.30¢ @ 9.35¢ for electrolytic, and 9.00¢ @ 9.15¢ for common casting stock.

**Pig Lead.**—Spot supplies have been light, and offerings for shipment this month have averaged rather small also. Purchases were not at all heavy, nor were the inquiries anything more than fair, but it has been difficult to buy carloads at under 3.17½¢ on the spot, or 3.15¢ for early shipment from Western points. January shipments offered at 3.12½¢ found few takers, however, and the indications are that there is no great confidence in the future of the market, whatever present conditions may be, since foreign Lead is quietly offered to consumers at comparatively low prices for future delivery. Sales of foreign have been made at 3.10¢ @ 3.12½¢ this week.

**Spelter.**—The demand has not improved. Orders for more than single carloads are still strictly the exception, and not many of those have been coming in during the past week. Offerings have increased slightly, giving the market a rather soft tone, but prices do not appear to have gone below 3.35¢ @ 3.40¢ for ordinary Western brands, delivered here or at a common point.

**Antimony.**—There is a fair jobbing movement that serves to keep prices steady at about 7½¢ @ 7¾¢ for Hallett's and 8½¢ @ 8¾¢ for Cookson's, ex store.

**Tin Plate.**—Probably more Plates have been turned out the past week than during the preceding one, but the market has shown no spirit, and the tone is, if anything, rather softer, since sellers are more anxious than buyers with both spot stock and forward shipments. Latterly business has been done in spot goods at about the following prices: Charcoal Tins: Melyn Grade, one-half X IC, \$4.75; IX, \$6.25; Lisvane, &c., IC, \$4.30; IX, \$5.12½; Al-laway Grade, \$4.20; IX, \$5; Siemens Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4.00 basis. Bessemer Steel, IC squares, &c., full weight, \$4.25 basis; 100 lb, \$3.95 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.00; 100 lb, \$3.65; 95 lb, \$3.57½; 90 lb, \$3.50. Charcoal Terns: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.50; IC 20 x 28, \$8.60; Alyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8; Alyn. 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.80.

Car wheels, weighing 650 pounds apiece, are being freely offered at \$4.75, at works, per wheel. The low price of old car wheels, \$8 per ton, partly accounts for the figure named.

A steel dam is to be built across the Santa Anna River in Southern California.

## Financial.

The meeting of Congress on Monday and the publication of President Cleveland's message have been the principal events of the week under review. It is too early as yet to observe the full effects of the message on the business of the country. As regards Wall street, however, the distinct assurances contained therein as to the maintenance of the gold reserve and the protection of the credit of the Government made a decidedly favorable impression, and the stock market, which had sunk into a dull and heavy condition last week, showed indications of reviving strength on Tuesday.

It has, however, been a matter of disappointment to many that the entire success of the Government loan and the replenishment of the Treasury gold reserve have not been followed by a more marked revival in general business, nor by more tangible improvement in the money and stock markets. Both of the last named markets continue flat and lacking in strength and stability. An effort was made by bankers, with some success, toward the close of last week, to advance rates on call money to 1½%, and a number of loans were placed at this figure, but the attempt to maintain the higher rate was abandoned in the current week, and abundant money was offered at 1% without borrowers.

Meanwhile the foreign exchanges have been advancing, and the prospects of a renewed export movement of gold this week have become very obvious. At the current rates of exchange gold could be sent to Paris direct without loss, and sterling is strong and apparently advancing to a point which would admit of profitable gold shipments in the near future. The expectation that a substantial proportion of the new Government 5% bonds would be sent abroad to European purchasers has not been realized. This fact accounts in great measure for the renewed strength of foreign exchange.

By payments for the new bonds the Treasury gold reserve has been re-enforced to the extent of about \$58,000,000, and now stands at \$110,000,000. A few more payments are due, which will bring up the reserve by the close of this week to about \$116,000,000. It is not unlikely, however, that some of this gold will be needed very soon for export. Every indication points in that direction. Of the gold paid out for the bonds, New York banks contributed \$50,400,425, the total payments from Chicago, Boston, Philadelphia and San Francisco reaching \$8,420,321, or \$58,820,746 for the issue. The estimated profits of the syndicate which purchased the bonds are placed at a minimum of \$1,000,000 and a maximum of \$2,000,000.

The monthly debt statement for December 1, issued on Monday, shows a net decrease in the public debt, less cash in the Treasury, during November of \$31,744,551. The interest bearing debt increased \$4,100,170; the non-interest bearing debt increased \$1,322,738.50, and the cash in the Treasury increased \$37,167,460. The balances of the several classes of debt at the close of business, November 30, were: Interest bearing debt, \$639,143,030; debt on which interest has ceased since maturity, \$1,826,930.26; debt bearing no interest, \$383,120,564.92. Total, \$1,024,090,525.18. The certificates and Treasury notes offset by an equal amount of cash in the Treasury outstanding at the end of the month were \$606,870,343, a decrease of

\$1,213,578. The total cash in the Treasury was \$793,140,163.96. The gold reserve was \$100,000,000. Net cash balance, \$44,507,605.95. In the month there was an increase in gold coin and bars of \$38,736,572.28, the total at the close being \$164,350,468.01. Of silver there was a decrease of \$1,216,256.24. Of the surplus there was in National bank depositories, \$16,729,473.73, against \$16,406,247.84 at the end of the preceding month.

The *Financial Chronicle* publishes the consolidated statements of national banks on October 2. Comparing this with the consolidated statements for October 3, 1893, the changes during the past year of depression are shown to have been as follows: The number of banks has decreased 26 and the aggregate capital has decreased \$9,678,492; the individual deposits have increased \$277,287,488 and the loans and discounts have increased \$163,441,954; the gold and gold Clearing House certificates have increased \$24,295,842, but the gold Treasury certificates have decreased \$9,611,570; the silver has decreased \$2,380,196, the silver certificates remain without material change at about \$28,000,000, and the legal tenders and United States currency certificates have increased \$43,914,676, or more than one-third.

Returns of railroad earnings for November, thus far received, are not, as a whole, encouraging. They show a decline of about 1.2% as compared with last year, and 10.5% below those of 1892. For several of the larger companies, notably the Granger roads, the comparisons of recent earnings with last year are particularly unfavorable. St. Paul, for example, in October, lost \$931,784 in gross and \$653,387 in net; Burlington & Quincy, \$759,546 in gross and \$249,999 in net. The Pennsylvania road and the Big Four, on the other hand, show a slight October increase. But the exhibits, as a rule, are of a disappointing character, and the prospects ahead are not as bright as could be wished for. The failure of the Erie Railroad to meet interest on its bonds appears to have had a particularly discouraging effect on the demand for railroad securities, which are just now very heavy in hand.

The stock market has been quiet except for another sensational fall in Sugar stocks, due to the recommendation by the President, in his message, of the abolition of the protective duty on the refined product, and the threatened closing down of the refineries by the Trust. The dealings in this stock at the close of last week and the opening of the current week were enormous, and accounted for nearly half of the business done on the Stock Exchange. Otherwise, speculation has been flat and the market for the most part dull and weak. A stronger tone was observable, however, on Tuesday, due probably in some measure to the effect of the Presidential message. Transactions, nevertheless, did not show any expansion, and the market remains in a condition of unsettlement, with a predominant feeling of greater hopefulness. Secretary Carlisle's report, published on Tuesday, had absolutely no effect on Wall street.

Railroad bonds during the week under review have been dull and heavy, with some recession in prices, but a stronger tone prevailed on Wednesday. Government bonds have been steady. The syndicate has sold about \$15,000,000 of the new 5s, and an advance in price to 119½ has been determined on.

As previously intimated, the attempt

of some of the banks to raise the rate of interest on call loans proved abortive. Round amounts are still offered at 1 %. Time money is again easier, with small prospect of any immediate improvement. Rates have reverted to almost the figures quoted previous to the payments for the bond issue. They are quoted as follows:  $1\frac{1}{2}$  % for 30 days,  $2\frac{1}{2}$  % for 60 days to four months and  $3\frac{1}{2}$  % for longer periods.

Mercantile paper of good quality is readily absorbed, but the supply is inadequate, although rather more choice names are in the market than has been the case for some time. Rates are 3 % for 60 to 90 days' indorsements,  $3\frac{1}{2}$  % @ 4 % for high grade single names,  $4\frac{1}{2}$  % and upward for others.

The market for sterling, as already noted, has become materially stronger, with good inquiry and considerable scarcity of bills. Bankers are indisposed to offer concessions, and as high as 4.88, plus brokerage, has been paid for demand bills deliverable the last of next month. Actual business was done on Wednesday at \$4.86 $\frac{1}{2}$  @ \$4.87 for 60 days; \$4.88 for demand; \$4.88 $\frac{1}{2}$  for cables, and \$4.85 $\frac{1}{2}$  @ \$4.86 for commercial. Cotton bills are particularly scarce.

Domestic exchange on New York is quoted as follows: Chicago, 35¢ premium; St. Louis, par bid; New Orleans, commercial, 1.25 discount; bank, par; San Francisco, sight par; telegraph, 5¢; Charleston, buying,  $\frac{1}{16}$ ¢ discount; selling,  $\frac{1}{8}$ ¢ premium; Savannah, buying at  $\frac{1}{16}$ ¢ discount; selling,  $\frac{1}{8}$ ¢ @  $\frac{1}{4}$ ¢ premium; Boston, 17¢ @ 20¢ discount.

## British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, December 5, 1894.

Lowness of prices has prompted more outside buying of Pig Tin at intervals. Early in the week this movement, along with liberal purchases for American account and better average prices at the Banca sale, stiffened prices to some extent. Afterward the market became irregular and prices declined from lack of support, owing to uncertain intentions of the syndicate and pressure from opponents. On Tuesday the price for prompts was carried down to £61 10/, making a decline of £1 for the week. To-day the market has been steadier. Sales made at £61. 10/ for prompts and £61. 10/ for three months' futures.

Copper has been dull and prices have ruled hardly steady. Speculators have realized to some extent, owing to doubts as to uniform action of producers. Consumers are very reserved. Speculation at present is quiet and wholly in distant futures. European stocks have increased 409 tons and the visible supply has decreased 463 tons during the past fortnight. Chili charters were 300 tons. Sales of furnace material include 500 tons Montana Matte at 8/3 in Liverpool and 1000 tons ditto in New York, on private terms. At the close Merchant Bars were quoted at £40 for prompts and £40. 7/6 for three months' futures. Best selected English is about £42. 10/.

Tin Plate market has been weaker. Makers are eager sellers at late rates,

but orders are scarce and buyers' views about 2d. per-box lower. Orders are scarce. Terns went at 18/6 for double box, ordinary Cokes at 9/6 and ordinary Charcoals at as low as 10/6. Stocks at shipping points show a further slight increase. Sellers' quotations at Swansea are as follows:

Bessemer Cokes, IC 14 x 20.....	9/6 @ 9/9
Siemens Cokes, IC 14 x 20.....	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20.....	18/6 @ 21/
Terns, 20 x 28.....	10/6 @ 12/6
Charcoals, IC 14 x 20.....	

Pig Lead has been quiet and the market is easy, with sellers at £9. 12/6 for soft Spanish and £9. 10/ the best bid.

Spelter is freely offered and prices are weak. Sellers at £14. 5/ for ordinary Silesian.

Pig Iron warrants have moved within a very narrow range only, and the market is extremely flat. Late dealings were at 42/5 for Scotch, 35/4 $\frac{1}{2}$  @ 35/6 for Cleveland and 43/6 for Hematite.

Black Plate has been in active demand, but chiefly at low and irregular prices.

The management of the Morewood Tin Plate Works have accepted workmen's offer to continue at a 10 per cent. reduction in wages.

## The Tin Plate Hearing

The arguments in the equity case of the Amalgamated Association against the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., to restrain that concern from operating their plant with non-union men and at a lower scale of wages than was fixed in conference in July last, came up in the courts in Pittsburgh on Monday, the 3d inst. After the bill of the plaintiffs had been recited the court inquired if there was a remedy in equity in personal contracts. The counsel for the plaintiffs answered in the affirmative, but the court expressed a doubt, and after a long argument on this point the prayer for a preliminary injunction was withdrawn and a plea for a decree for damages for the wages of the workmen on the contract was substituted. M. M. Garland, president, and J. C. Kilgallon, secretary of the Amalgamated Association, were the only witnesses examined. They related the circumstances of the several conferences with the manufacturers and told of the stipulation for a change in the scale contingent on a material reduction in the tariff. After long arguments by both sides the hearing was adjourned, and a decision is expected to be rendered this week.

The three leading rod mills made the following records in October: Beaver Falls produced 7013 gross tons of wire rods in 54 single turns, the Joliet Mill made 6817 tons in 51 turns and the Oliver Mill 6749 tons in 52 turns.

Estimating the December product, the output of pig iron of one firm in Pittsburgh will be 1,200,000 tons in 1894. The same concern made 128,500 tons of steel ingots in the month of October.

The suit brought by the Thomson Electric Welding Company of Lynn,

Mass., against the Two Rivers Mfg. Company of Wisconsin, has been terminated by the entry of a decree sustaining the validity of the fundamental patents of Elihu Thomson on electric welding and apparatus therefor, and adjudging that the defendants have infringed the same. Several weeks ago a preliminary injunction was granted against the Two Rivers Mfg. Company by Judge Seamans, who rendered a strong opinion sustaining these patents. The case was carefully tried on behalf of the defendants, and all known defenses were before the Court. The Judge found, however, that the patents were valid and were not affected by any of these defenses and granted an injunction. The Two Rivers Mfg. Company have settled for the past and taken a license from the Thomson Electric Welding Company on their regular terms.

## The Bostwick-Braun Company's Catalogue.

The Bostwick-Braun Company, Toledo, Ohio, have just issued a handsome catalogue of 1100 pages, devoted to a representation of the goods carried by them. The book is 8 x 11 inches in size, making it convenient for practical use, and is well bound in leather. A full page view is given of their establishment, 319-322 Monroe street, corner of St. Clair street. The goods are conveniently arranged in classified departments, as follows:

	Pages.
Mechanics' Tools.....	1 to 237
Bar Iron and Steel, and manufacturers' supplies.....	238 to 311
Carriage and Wagon Hardware.....	312 to 321
Miscellaneous Hardware and Brushes.....	322 to 370
Farm and Garden Tools.....	371 to 433
Store supplies, &c.....	434 to 471
Builders' Hardware.....	472 to 792
Ammunition, Revolvers, Sporting Goods, Fishing Tackle, Skates, Velocipedes, Tricycles, Express Wagons, &c.....	793 to 824
Pocket and Table Cutlery, Shears, Razors, Plated Ware.....	825 to 890
House Furnishing Hardware, Wooden Ware and Wire Goods.....	891 to 975
Granite, Japanned, Pieced, Stamped and Galvanized Ware.....	976 to 1,027
Sheet Iron Ware, Stove Trimmings and Hollow Ware.....	1,028 to 1,049
Tinners' Trimmings, Stock, Tools and Machines.....	1,050 to 1,100

There is also an alphabetical index immediately following the classification of departments. The book is fully illustrated, representing the goods in an admirable manner, this being a feature in the arrangement of the catalogue to which particular attention was paid. An unusually large number of pages have been devoted to Builders' Hardware, making an excellent showing of Lock sets, store door handles and other house trimmings. The book is well printed on a fine quality of paper, while descriptions and price lists are full and conveniently arranged. The catalogue will take rank among the best of its kind, and will be appreciated by the trade who receive it.

E. C. STEARNS & Co., Syracuse, N. Y., have purchased the patents, tools, &c., of the Vanderbilt Sash Balance, and will hereafter manufacture these goods. They have been selling this Balance for a year or more, and their experience has convinced them that it has merit.

# HARDWARE.

## Condition of Trade.

**B**USINESS is showing the falling off which usually comes with the commencement of the last month of the year, when both wholesale and retail merchants are giving their attention to closing up the year's business, getting stocks in order for inventory, and endeavoring to keep them down as low as possible. Purchases are therefore limited to urgent and immediate requirements and special holiday and winter goods, which are being ordered more freely. There is also a good deal of negotiation going on between large houses and the manufacturers in regard to the terms on which stock orders for next season may be placed, and some of the manufacturers report gratifying results as to the extent of orders already booked. Buyers, both large and small, however, realize that the market is weak as well as low, and it is a difficult question which they are called upon to decide as to the extent to which orders should be placed at this time. It is evident that a policy of delay carries with it not only the chance of a further decline, but also of a stiffening in the market and advanced prices. In some staple lines manufacturers, who are anxious to have orders to keep their plants in operation during the year, are refusing to quote prices at present current for deliveries later than March or April, the opinion being entertained by many that a recovery from the present low prices is likely to come with the increased demand. It is, however, a fact that at this time there is a good deal of weakness in many lines, and the tendency in both heavy and shelf goods is toward lower prices. It is plainly the part of wisdom for the trade to watch the market closely. There is some complaint in regard to collections, but financial conditions, on the whole, appear to be fairly satisfactory.

### Chicago.

(By Telegraph.)

Shelf Hardware keeps up remarkably well for December. The mails of the past few days have been almost as heavy as at any time in the year. This is doubtless due, as previously explained, to the careful manner in which country merchants have long been buying,

so that they are compelled to continually replenish their stocks; nevertheless jobbers are expecting their trade to show a gradual decline for the remainder of the month, and will not be disappointed if the next two or three weeks prove to be dull. The Tinware and House Furnishing jobbers report a better demand. Small goods in this line show special improvement. Salesmen are sending in very favorable letters regarding the outlook for the future; factories are catching up on orders and are now able to make more prompt deliveries. Heavy Hardware is inclined to quietness, as usual this month. The jobbers themselves are buying sparingly with the close of the year approaching, and their customers follow the same practice. A very much larger business is looked for after the turn of the year.

### St. Louis.

(By Telegraph.)

The demand for Hardware is beginning to show a marked falling off as the holiday season approaches, and the balance of the year will not likely show any particular changes. Jobbers, as well as retailers, will soon be preparing for the annual inventory, and there is considerable satisfaction in the fact that the year now nearly closing will show considerable improvement over 1893. There is no great inquiry for any particular line of goods, but the demand is more of a general character. The retail trade still continues to order in small quantities, and many of those who formerly were car-load buyers cannot now be induced to purchase anything like they formerly did. Unfortunately, we cannot make any favorable reference to prices, as they continue to be, generally speaking, weak and unsettled. The turn of the year is expected to bring some improvement in this direction. It is intimated that the recent advance in Carriage Bolts will be followed by an additional advance before many days. Stocks in jobbers' hands are more or less depleted and are in such shape that any heavy demand would be immediately felt in prices. Collections are in excellent shape.

### Cleveland.

**THE W. BINGHAM COMPANY.**—We can report a fair business for the month of November. The general good weather in this section has carried the demand for Wire and Builders' Hardware along so as to round out shipments fairly well. Holiday goods have moved freely. We note in Cutlery a demand for cheap goods, which have now become scarce. Orders for spring shipment are coming in about as usual, very early shipment being generally specified.

### New Orleans.

**A. BALDWIN & CO.**—There is nothing special in the situation in this section, excepting that it is much more quiet in all lines of business than it has been for some years back. Orders are not very plentiful and most of them are simply for immediate wants in a small way. Almost complete depression in all lines would about represent the general condition here. December is usually a quiet month with us and we do not look for much improvement until after the new year sets in.

### Boston.

**BIGELOW & DOWSE COMPANY.**—Trade continues fully up to the average. The jobbers are handling more goods, and, considering the great decline in prices, one who exceeds his or their past record and who sells more, in amount, has reason to be well satisfied. The brisk cold weather for the past ten days has stimulated the demand for Skates and stocks are broken. The early trade means a large one and a shortage later on. To-day the ground is white with snow and the sleigh bells have a merry sound. We need cold weather in winter to satisfy the average New Englander, and it looks now that he will be happy. Until Christmas December is a busy month—after Christmas the salesmen are kept busy in booking orders for spring delivery. There is very little complaint of remittances.

### Philadelphia.

**SUPPLEE HARDWARE COMPANY.**—There has been considerable activity in trade during the last two weeks, and one noticeable feature has been the orders received for a general line of goods, showing there has been considerable activity with the retail trade since orders were placed earlier in the fall. The trade looked with some anxiety to learn if goods bought early in the fall had been disposed of. Recent orders indicate that there has been fair trade throughout the entire territory tributary to our city. Indeed, the last two weeks may be looked upon as having been "fairly good trade weeks," based upon conditions of the last 20 months.

The Cutlery trade during the last month has exceeded that of any time during the last two years, thus showing depleted stocks, and also showing a desire to replenish before the holiday season is fairly upon us.

A fair number of orders have been received for season goods in advance of wants—namely, Skates, Sleds, &c.

Present indications are that we will have at least two weeks of further good trade from this date, although there are a great many persons who take a gloomy view of the reassembling of Congress, December 3. However, nothing will be done that can affect trade between this and January 1. Any action taken by Congress damaging to trade would show itself in the opening of the year 1895.

The low prices which continue on goods is a matter of wonder to many persons in trade.

Collections are not up to what was anticipated or looked for at this time of the year.

The abundance of money in the leading Eastern centers is shown by the quickness with which the Government loan was absorbed, and while it may reduce the surplus held by the banks, the lack of new enterprises will enable, or compel, banks to hold a surplus far beyond their legal reserve and far beyond what they would like if it could be readily placed with satisfactory assurance of payment.

#### St. Paul.

FARWELL, OZMUN, KIRK & Co.—December 1 finds the Hardware jobbers here in as favorable condition as expected. November carried a very fine trade right along, with no boom, but a steady demand for nearly all lines of seasonable as well as regular goods and in some lines, such as Builders' Hardware, a demand beyond the stocks on hand, which had been considerably reduced, owing to the uncertainty of the trade to be anticipated, and also to the tendency toward lower prices.

The weather has been exceptionally favorable, with a break of only two or three days about the 20th. Here at St. Paul the Mississippi is still open, and the probability is that it will remain so for some time yet. Thirty or 40 years ago the St. Paul rustlers were accustomed to take a short steamboat ride December 1—when they could—and, although they wore their buffalo coats and their teeth chattered, it was their special pleasure to announce the fact of a pleasure steamboat ride in December to the outside world, which then knew so little of the New Northwest.

Since then its resources, as well as its very desirable climate, have become so well known that even the survivors smile when referring to those days of big expectations and small things.

As a matter of fact it is seldom that any section of the country is favored with a more delightful climate than has been enjoyed here since July. Its effect on trade has been good and the conditions for present trade, as also for the spring, may generally be considered favorable. Jobbers expect an earlier and a somewhat larger spring trade than that of last spring. December will have considerable trade, especially in seasonable goods, but the volume in some lines will depend on the weather.

#### Baltimore.

CARLIN & FULTON.—While the last month of the year is seldom marked by heavy purchases, there is always a brisk demand stimulated by the advent of cold weather and the approaching holiday season, and were prices this year anywhere near those of a few years ago, no doubt trade would be called good.

Remittances are fairly good, though in some instances our customers ask for accommodation on account of the unwillingness of the planters to part with their cotton at the present unprofitable price, hoping that by holding on for a little while better figures may be realized. This happy result sometimes happens, but has not been the experience of the farming community for a long while, and it has

generally happened that the early market is the best and the first loss the least.

With the commendable spirit of Mark Tapley our salesmen prophesy better things after January 1, and we suppose of them the poet might have written, "Hope springs eternal in the salesman's breast, man never is but always to be blest."

#### Louisville.

W. B. BELKNAP & Co.—General business conditions in this part of the country are not unfavorable. There has been a small advance in the price of cotton, and that great staple on which so many are dependent is moving very freely, according to the market reports.

This is proverbially the dullest time of the year in Iron and Hardware, and manufacturers are casting about with more or less activity, in order to maintain their tonnage until the purchasing for the new year's account shall begin in good earnest.

Prices are at an extremely low ebb, and, barring Scrap, there seems to have been no life or anything looking toward better prices. More mills are at work, and the fact that their product is fairly absorbed is most encouraging.

The dry weather continues with us, and while it affords an opportunity for outdoor work, fencing, &c., this is fully offset by the trouble in many sections of getting water even to supply live stock. It has never been known at this time of the year to happen that stock had to be driven miles to water, as is now the case in some of our neighboring counties. The weather bureau tells us that up to date we are 9 inches short of our annual rainfall. This has forced much tonnage on the railroads which usually comes by river.

#### San Francisco.

MILLER, SLOSS & SCOTT.—The mining interests of this coast have always been large contributors to the business of San Francisco, and especially to the Hardware trade. It is therefore but natural that we all took considerable interest in the recent regular meeting of the miners' convention, which took place in this city, and which drew together a very much larger crowd than usual. This was shown by the attendance at the banquet given by the merchants of San Francisco, the number present being nearly 300.

What is particularly gratifying in this increase of mining ventures is the fact that the companies are being formed for legitimate purposes of mining and not with the idea of fleecing the public as in the past. Furthermore, the element of speculation is reduced to a minimum, for the reason that the mines now being operated are for the most part not new discoveries, but old claims that have not been worked before, because with the former machinery we were not enabled to save sufficient of the mineral contents of the ore. Rock that ten years ago would be worked only at a loss can now, with the aid of the latest improvements, be made to yield a handsome profit.

We hope to see a large increase in business with mining companies during the next year, and have every reason to believe that it will continue to grow.

Business in general has continued to be quite satisfactory. We must, how-

ever, expect that with the approach of the end of the year sales will naturally drop off.

#### Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—Throughout the past two weeks the weather has been exceptionally warm and pleasant for November, and not until recently has the thermometer dropped to a point sufficiently low to stimulate business to a perceptible extent, consequently we have to report a continuance of the very fair trade that has prevailed all the month.

There have been no especially interesting features to record. A good, fair movement of seasonable goods expresses the situation, and jobbers of Hardware, as a rule, appear to be satisfied with the showing.

Of course, business is not all that could be desired by any means, but under existing conditions it is about all that could be asked or expected. Reports from the East agree that there is a decided improvement there, and the wave must necessarily move westward.

The business world knows now that tariff legislation will be likely to remain undisturbed for two years any way. Certainty is what the business of the country needs, and two years of peace will work wonders for the commercial conditions, no matter which party wins in the next Presidential contest.

### Notes on Prices.

**Wire Nails.**—There is an excellent demand for this season of the year, but it begins to show signs of falling off. Some large orders have been placed for next season, but some of the principal buyers are delaying their purchases, thinking that possibly prices may go lower. The desire of the manufacturers to keep their mills in operation during the next few months makes competition very active, and nearly all of them are evidently anxious to secure such business as they can. The market is represented by the quotation of 85 to 90 cents for carload lots at mill, the former figure being obtained only on attractive orders. The manufacturers are endeavoring to hold as firmly as possible to the higher figure. Small lots from store are held at \$1.20 to \$1.25.

**Chicago, by Telegraph.**—Plenty of inquiry is reported for January, February and March, but the demand for early delivery is light. Some of the manufacturers have taken large orders for delivery during the first quarter, but others are not disposed to meet present prices so far along into the future, and are discouraging this class of orders. Quotations continue in the vicinity of \$1, Chicago, for factory lots; jobbers are endeavoring to maintain \$1.10 for small lots from stock, but this is shaded to best buyers by some houses.

**Cut Nails.**—The demand for Cut Nails is moderate, and with the approach of the close of the year is lighter than it has been during the past month or two. Quotations



which the mills are making are apparently based on 75 to 80 cents, at mill, in carload lots, 60-cent average. The New York price for carload lots on dock is about 90 cents with a similar average, but this price is sometimes shaded. Small lots from store are held at 95¢ to \$1.

*Chicago, by Telegraph.*—The Cut Nail trade appears to go on in a very even way. Orders continue to come in in single carload lots, but they are being received steadily. Prices are unchanged, standing at 90 cents, Chicago, for 60-cent average. Small lots are quoted at \$1 from stock.

**Barb Wire.**—The Barb Wire market continues in the same state as at our last report. Some large orders have been placed, so that with the business previously secured the mills have a considerable portion of their output covered. There is still a good deal of inquiry, and the indications point to an exceptionally large business being done during the coming year. The large houses are recognizing the desirability of placing their orders in time, so that they may not, as heretofore, happen to be disappointed in receiving the Wire by the time it is required for their trade. In the matter of price the market shows little change. It is represented by the quotation of \$1.85 to \$1.90 for Four Point Galvanized in carload lots at mill.

*Chicago, by Telegraph.*—Barb Wire manufacturers have recently been reaching out for business very actively. The season was rapidly passing for making contracts for spring delivery, and the breaking up of the pool enabled each manufacturer to go on his own account and sell without restraint. The consequence is that mills in this vicinity have their order books well filled now for at least the first three months of the year and possibly beyond that. The demand for other classes of Wire products continues very good, and the outlook for the future is as bright as before. Jobbers are quoting small lots of Painted Wire from stock at \$1.75, and Galvanized at \$2.10. Manufacturers have recently refused to fill small lots at 2 cents from factory, thus showing that they are in better condition and disposed to maintain better prices.

**Augers and Bits.**—A good deal of irregularity has been developed in the market for Augers and Bits and low quotations are current. Some of the manufacturers, however, refuse to meet the extreme prices which are being made. The market now being an open one and the competition between the manufacturers active, this line of goods is unsettled and on the whole in an unsatisfactory condition.

**Cordage.**—The market on Cordage has not improved during the past week or two, and the low prices to which we recently referred have become more general. The competition between the

manufacturers is active and the demand moderate. The market is represented by the following quotations for large lots, f.o.b. factory or New York, prices given being subject to 1½ per cent. discount for cash:

	Base. Cents.
Manila.....	7½
Sisal.....	4½
New Zealand.....	4½

**Carriage Bolts.**—The market for common Carriage Bolts is in a somewhat better condition than a few weeks ago. The effort of the manufacturers to check the downward tendency was apparently attended with a good measure of success, and the extreme price which they fixed upon has apparently been pretty well adhered to, notwithstanding the fact that there are rumors that it has been slightly exceeded. There is no doubt that the goods at current prices are unprofitable, and as a reaction from the demoralization which has characterized this line for some time it is possible that the manufacturers may be able to come together again and reach some kind of an agreement or form an organization which will have the effect of putting the market in better shape.

**Chisels.**—The Chisel market has recently developed considerable weakness, and lower prices than have recently prevailed are now current. The manufacturers refer to the present quotations as yielding little if any margin of profit, and the goods are certainly very low. Manufacturers are evidently anxious for business.

**Family Grindstones.**—We are advised by the Grafton Stone Company, Grafton, Ohio, that they are furnishing their goods, f.o.b. quarry, at the following prices:

	Per dozen.
6 and 7 inch.....	\$4.00
8 and 9 ".....	4.60
10, 11 and 12 inch.....	6.35

These are referred to as having their special enameled base boards and screw clamp, the stone being polished and the goods packed half dozen in a box. Loose Grindstones, 30 to 200 pounds, are quoted at \$6 to \$8 per ton. The following prices are also announced:

	Each.
No. 1 Grafton Mounted Grindstone...	\$1.50
No. 2 " " ".....	1.80
No. 3 " " ".....	1.15

**Glass.**—Reports regarding the condition of the American Window Glass trade indicate that a steady demand has taken the place of the spasmodic hand-to-mouth orders, and that in some instances manufacturers have booked orders equal to the capacity of their factories for some time to come. It is understood that some orders are of a speculative nature, those placing such orders being confident enough of the future to anticipate an advance in prices. More conservative dealers, however, do not look for higher prices before spring and are

not making purchases much beyond their probable requirements. Business among jobbers is reported as fair and as showing an improvement over that of the early fall. Building prospects are considered good, and a large amount of work in this direction is being contemplated throughout the country. Factory quotations at Pittsburgh for Glass in car lots are given as 90 per cent. discount for single and 90 and 5 per cent. discount for double strength Glass. Cleveland, Ohio, jobbers quote Glass from store in full boxes at 85 and 20 per cent. discount for single and 85 and 20 and 5 per cent. discount for double strength Glass.

## Hardware Organizations.

### Hardware Club of New York.

The following gentlemen were elected to membership in the Hardware Club of New York at a meeting of the Board of Governors held on Monday, December 3:

F. H. BAWO,  
30-32 Barclay, street, New York.

CARL F. W. BAWO,  
30-32 Barclay street, New York.

WM. C. BEECHER,  
237 Broadway, New York.

JOHN H. BIRD,  
279 Broadway, New York.

G. W. BLANCHARD,  
13 Park Row, New York,

FREDERICK T. BROWNING,  
American Wringer Company,  
New York.

ROBERT N. BRUNDAGE,  
Patterson Bros., New York.

THOS. H. COCHRANE,  
156 Sands street, Brooklyn.

DANIEL F. COHALAN,  
271 Broadway, New York.

L. C. DESSAR,  
261 Broadway, New York.

FREDERICK HAVILAND,  
29 Barclay street, New York.

JOHN A. HILL,  
Editor *Locomotive Engineering*,  
New York.

CLARENCE H. MACKAY,  
253 Broadway, New York.

CHARLES W. MACKAY,  
American Axe & Tool Company,  
New York.

OLIVER A. MARSH,  
3 Park place, New York.

WILLIAM T. NORTON,  
American Axe & Tool Company,  
New York.

FRANK J. OLIVER,  
Oliver Bros., New York.

F. J. ROOT,  
New York Wire Cloth Company,  
New York.

THEODORE E. SMITH,  
Russell & Erwin Mfg. Company,  
New Britain, Conn.

EDWARD STAGG,  
Patterson Bros., New York.

GUSTAV VINTSCHGER,  
Markt & Co., New York.

In view of the rapidly increasing membership of the club and the near

approach to the limit of membership, notice has been given that in accordance with the provisions of the constitution, at the next meeting of the club a motion will be made to raise the admission fee to \$100, instead of \$50, the present figure.

Steps are also being taken to make arrangements for the annual Hardware dinner, which it is intended to hold early in the year.

#### Nova Scotia Iron and Hardware Association.

The wholesale and retail Hardware merchants of Halifax, N. S., have perfected an organization under the style of the Nova Scotia Iron and Hardware Association of Halifax. The association is in successful operation and the

membership comprises 16 houses. The officers of the association are as follows: Edward Stairs, president; W. C. Brine, vice-president; F. J. Cragg, secretary and treasurer, and A. M. Bell, J. W. Stairs and A. J. Grant, committee.

The association have regular monthly meetings, after which they sit down to light refreshments, and occasionally there is a dinner. At the meetings questions of interest to the local trade are discussed, the regulation of prices being the most important one. In some lines a scale of prices has been adopted to which the members have invariably adhered, thus insuring a fair margin of profit on the goods concerned.

which a choice can be made, each maker claiming some pronounced advantage for his tire over any preceding one. Resiliency and ease in repairing are features which all manufacturers strive to incorporate in their double tube Tires, while each maker puts forth his best efforts to have his Tire the fastest. Some riders prefer the single tube or hose Tires, which are cemented to the rim, and of these there are a large number from which to select. For the season of 1895 there are a large number of new Tires put on the market, among which is the L. C. Smith double tube Tire, suitable for both steel and wood rims, of which an illustrated description is given in this issue. A number of

#### Wholesale Houses

throughout the country have found it to their advantage to make Bicycles a prominent part of their stock in the past, while other jobbers are taking up this line this year for the first time. Among the new firms engaging in the business we are pleased to notice the SUPPLEE HARDWARE COMPANY of Philadelphia. The company are entering the field as jobbers with a complete line of wheels and will act as exclusive agents in the States of Pennsylvania, New Jersey and Delaware for the Syracuse Cycle Company's line of wheels, and for the Elmore Mfg. Company's line of medium priced machines. They will also handle a few high grade wheels to be known as the Supplee Special. In addition to the foregoing the company will have a line of cheaper goods in juvenile wheels, together with a complete line of sundries and accessories. The Bicycle department will be in charge of the treasurer of the company, William D. Supplee, assisted by William A. Richwine, who, until December 1, was manager for the Pope Mfg. Company's Washington agency, known as the District Cycle Company. Mr. Richwine is known as a gentleman well acquainted with the trade and its wants and thoroughly conversant with the Bicycle business, as shown by the marked success in the management of the Washington department. An advertisement of the Supplee Hardware Company appears in this issue.

FARWELL, OZMUN, KIRK & Co., St. Paul, Minn., are preparing for a very active season in Bicycles, and advise us that they have a notably strong line of wheels to push. The Syracuse will form their high grade line, comprising six models—a tandem, weighing 38 pounds; racer, 17 pounds; special, 20 pounds; light roadster, 23 pounds; fat man's wheel, 26 pounds, and ladies' wheel, 24 pounds. It is stated that the '95 Syracuse wheels are handsome in appearance and that the crimson rim promises to be more popular than ever in '95. For a medium wheel the company will push the Crawford, of which they have exclusive control in the Northwest. This line includes the following: Twenty-eight-inch diamond and drop frame, 24 pounds, \$75; 28-inch diamond and drop frame, a trifle heavier

## Bicycles for 1895.

*In the following columns we give further information in regard to prices and patterns of wheels which will be put on the market by manufacturers during the coming season, with special reference to the Hardware trade, through whom Bicycles will evidently be marketed to a much larger extent than ever before.*

#### Bicycle Repair Shops.

IN CONNECTION with the handling of Bicycles, the difficulty of having a suitable repair shop, more than, perhaps, anything else makes Hardware merchants reluctant to enter upon the sale of the goods. It is, of course, quite feasible in many cases to sell Bicycles and not repair them, leaving this for other shops who may make this their business, but sometimes arrangements can be made with some mechanic in the town who will look after such repairs for the merchant. It is, however, exceedingly desirable, in order to handle Bicycles to the best advantage, to have a repair shop. A great many of the repairs which are required are very simple and easily done, while others, of course, require a good deal of skill, and some of them quite a mechanical outfit. Unless the shop is particularly large and complete some of the more difficult repairs will need to be attended to at the factory or other place where facilities are found for such work.

In another part of this issue will be found an article on Bicycle repair shops, to which attention is invited. It gives, it will be seen, some practical suggestions which will aid the merchant who is conducting or intending to conduct such a shop.

It is a matter of regret that there is such difficulty, even in concerns which make the handling of Bicycles a speciality, in having ordinary repairs done in a correct and workmanlike manner. It is a matter of common experience that such repairs are often in many apparently well equipped Bicycle establishments done in a shiftless and bungling manner, the machine not infrequently being butchered in the operation. This is owing to carelessness and lack of knowledge and skill

on the part of the repairers, many of whom had little training for their work.

#### Articles on Bicycle Repairs.

The article we publish elsewhere will be serviceable as giving practical hints from one who has had experience on the subject concerning which he writes. The subject, however, is of so much importance that we will give, beginning with the new year, a series of illustrated articles on Bicycle repairing, with special reference to the circumstances and needs of small shops, and particularly those in connection with Hardware stores. In these articles we will give illustrations making plain the different methods of doing the common and the more difficult repairs. We hope to make the articles so comprehensive and detailed, and at the same time so plain and practical, that they will be of great service to any who undertake the kind of work to which they relate.

We are desirous of making these articles as complete and as useful to Hardware merchants as possible, and invite the co-operation of the trade, from whom we shall be glad to hear in regard to—

1. The difficulties they find in connection with the Bicycle repair department;
2. Any suggestions as to the subjects which should be covered by the articles we are preparing;
3. Any improved methods of making the ordinary or more difficult repairs.

#### Tires.

The subject of Tires is one of never ending interest to Bicycle riders, and is consequently one of great importance to that portion of the Hardware trade who handle wheels. Each year brings an addition to the number of tires from

than 24 pounds, \$65; 26-inch diamond and drop frame, a trifle heavier, \$50, and 24-inch diamond and drop frame, a trifle heavier, \$40. Wood rims and M. & W. tires will be used on all. A large assortment of sundries will be included in their stock, also Tricycles and Velocipèdes.

#### Manufacturers' Announcements.

H. A. LOZIER & Co., Cleveland, Ohio, a portion of whose factory was destroyed by fire November 28, find their buildings in a better condition than was at first supposed possible, and that much of great value was saved. Under date of December 3 the company issue a circular letter to the trade, which is in part as follows:

Our Tool building, 50 x 145 feet, a two-story brick building, is intact, excepting the loss of windows on one side, which are already replaced, and a force of 150 men will be at work there on Bicycle construction to-morrow. On the lower floor of this building we have stock for several thousand wheels untouched by fire and not in the least damaged. We also saved in this building \$50,000 worth of fine improved modern Bicycle machinery, together with a large number of special Tools for our 1895 wheels. Our blacksmith shop, forging shop and brazing department are but slightly damaged and will permit immediate resumption of work therein. Our storehouse, a three-story brick building, 60 x 100 feet, is all right, together with 462 wheels of 1894 pattern, in crates, and thousands of unfinished parts. We can now promptly ship 1894 styles. Within two weeks this building will be filled with Bicycle machinery and will be running day and night with a large force of men. Our boiler and two engines are unharmed, so that we have abundant power, giving us a Bicycle factory with facilities for turning out a product equal or larger than three-fourths of the high grade factories in the country to-day. In addition to these buildings we have several others for temporary use, which, with assistance from some of the largest machine screw companies in the country, will fully enable us to supply our trade. While we are thus prepared to protect you in your business by furnishing you Cleveland wheels on or before February 1, 1895, we shall immediately replace that part of our works which was destroyed. With these assurances, supported by adequate manufacturing facilities, we are now in a position to pledge our customers that we will take care of their wants in the best possible manner. Our 1895 line will be ready for market in ample time, so that our customers need not lose a single sale by reason of their not being able to procure Cleveland wheels. In conclusion, we beg to state that we should be pleased to meet all our dealers and friends at the time of the Cycle shows. We shall be at the Chicago show with a full line of samples of 1895 wheels, and upon the occasion of the New York show we will present our line at our New York branch, 337 Broadway.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio, show a line of wheels in their 1895 catalogue, including Gendron No. 14, a ladies' wheel, weighing 33 pounds, \$90; Gendron No. 15, men's wheel, weight 27 to 30 pounds, \$85; Gendron No. 17, 26½ pounds, \$85; Gendron No. 18, ladies', 22½ pounds, \$105; Gendron No. 19, men's, weight 21 pounds, \$100, and Gendron special, 19 pounds, \$115. The machines will

be fitted with the company's Buckeye pneumatic tire.

WARWICK CYCLE MFG. COMPANY, Springfield, Mass., state that their 1895 models are of entirely new design, and that the prices which apply to these models will go into effect January 1, 1895, at which time the wheels will be ready for delivery. The following is a list of their models for the coming season: Model 21, roadster, high frame, 28-inch wheels, 20 pounds, \$100; Model 22, ladies', drop frame, 28-inch wheels, 23 pounds, \$100; Model 23, roadster, low frame, 28-inch wheels, 20 pounds, \$100; Model 24, ladies', diamond frame, 28 inch wheels, 20 pounds, \$100; Model 25, roadster, 28-inch wheels, 25 pounds, \$80; Model 26, ladies', drop frame, 28 inch wheels, 27 pounds, \$80, and Model 27, racer, 26 or 28 inch wheels, 17 pounds, \$125. The company state that their 1894 product has been disposed of and that they have no wheels to offer at the new prices until the latest models are ready for the market.

GEORGE N. PIERCE & Co., Buffalo, N. Y., state that their models throughout for the coming season are from their own designs and embody all that is modern and practical in Bicycle construction; also that the materials used in the construction of their wheels are of the very best, and that their equipment is high grade in every respect. They offer a varied equipment of tires in the Morgan & Wright, New York, Hartford Rubber Works Company's, Wizard, G. & J. Dunlap, and Palmer. Their high grade Bicycle has been named The Pierce, while the name Queen City will be continued in their juvenile line. The list of machines is given as follows:

Pierce, Model 1, roadster, 24 pounds, \$75; Pierce, Model 7, ladies', 28-inch, 25 pounds, \$80; Pierce, Model 2, roadster, 22 pounds, \$85; Pierce, Model 3, racer, 19 pounds, \$90; Queen City, Model 8, 26-inch, ladies', \$50; Queen City, Model 4, 26 inch, deep diamond, \$50; Queen City, Model 5, 24-inch, deep diamond, \$40; Queen City, Model 9, 24-inch, misses', \$40, and Queen City, Model 6; 20-inch, diamond, \$40.

The advertisement of the firm will be found on another page in this issue, in which it will be observed that they call attention to their machines as forming a desirable agency for Hardwaremen.

ELMORE MFG. COMPANY, Clyde, Ohio, advise us in regard to their line for the coming season as follows:

The coming season we shall manufacture four models, three gents' and one ladies'. The lightest wheel we shall make will weigh 22½ pounds which will be called the Elmore Scorchers No. 6. Our roadster, Model No. 7, will weigh about 25 pounds. All our gents' models will be characterized by the popular high back frame, the top tube being nearly horizontal; also, the tubing will be of larger diameter than that we used last year, which makes a strong and rigid wheel. We shall make three styles of handle bars—the raised, which will be used mostly on the ladies' wheels; the medium, on the roadster, and both the medium and extreme on the Scorchers. We shall use either wood or steel rims, at the option of the purchaser. We shall use a fine quality of swaged spoke wire with rolled thread. Our bearings will be made from tool steel, and will be

dust proof. We shall cut all our hubs from the bar, which allows us to make them very light and neat.

CYCLONE COMBINATION CYCLE COMPANY, Jamestown, N. Y., will have for the coming season the Dorsett Improved, a hand and foot combination, made in both Bicycles and Tricycles. The machine is referred to as three wheels in one—as, in addition to being used as a combination machine, weighing 28 pounds, it can be changed to a machine of the regular pattern and also to a racer weighing 22 pounds. The machine in combination form is referred to as providing for the use of the muscles of the upper part of the body as well as the lower, a gymnasium on wheels. The company have arranged to establish headquarters in the Mutual Reserve Life Insurance Building, 309 Broadway, New York, about the middle of the present month.

BIDWELL-TINKHAM CYCLE COMPANY, 306-310 West Fifty-ninth street, New York, notify us as follows as to their line of Cycles:

Our tourist line for the coming season will be as follows: \$100 wheel, weight 22 pounds; \$85 wheel, weight 26 pounds; \$70 wheel, weight 26 pounds; \$55 wheel, weight 29 pounds. These wheels will have separate names, not given as yet. There will be three heights of frames to each wheel except the \$55 one. They all will have narrow treads and all will be of the same strength and quality—that is, the same tubing will be used throughout. All will have wood rims.

BUFFALO CYCLE COMPANY, Buffalo, N. Y., issue a circular letter to the trade from the Buffalo Tricycle Company, Buffalo, N. Y., explaining the change which they have made in the company's name:

The demand for Envoy and Fleetwood Bicycles having made that branch of our business of more importance than Tricycles, we have thought best for the interest of all concerned to change the name of the Buffalo Tricycle Company to that of Buffalo Cycle Company. The change in name of our company should in no wise be confused with that of the Buffalo Cycle Works. Under the name of Buffalo Cycle Company we will continue to manufacture Bicycles and Tricycles as heretofore. The trademark adopted by us will therefore be recognized wherever seen as being synonymous with good material and honest construction, in whatever we may build and place upon the market.

#### Golden Wedding.

JOEL SHARP, the popular president of the Salem Wire Nail Company of Salem, Ohio, celebrated his golden wedding on the 21st ult. It was a most interesting occasion, being graced by the presence of a large number of friends who gathered to pay their respects to the veteran manufacturer and his esteemed wife, and to wish them many more wedding anniversaries. Telegrams of congratulation were received from a great many friends and business acquaintances who were unable to be present. Celebrations of this character are rare, as the vicissitudes of life



by the office help. After all pricing and figuring is completed, the books are examined to see if they are correct. The advantage of using sheets lies in the fact that a few of them can be given to several persons to figure at the same time. The sheets are numbered so that a loss of any one will be easily detected. The additional advantages of the system are referred to as being that no unnecessary work is performed, that the labor is so divided that it is comparatively easy for all, that any particular stock can be located at once, and that full information regarding it is at hand.

## How to Take a Quick Inventory.

BY H. P. TOWNLEY.

During an experience of 20 years the pricing has been the slowest and hardest part of the taking of our inventory, so we now try to make everything bend to the pricing. The first step is to get the stock in the best possible shape. On deciding the first week in January to be the best time for this work, all the spare time of clerks and porters during the previous week is spent in arranging, cleaning and counting stock; also during this week the cost book is carefully brought down to date.

### Arranging Goods.

Take all scattered goods from show windows, showcases, &c., and put each kind by itself. For example, Cutlery, Spoons, Granite Ware, Hollow Ware, Stamped Ware, &c., being massed upon the shelves so that they can be invoiced together. Then lists and discounts can be easily used in the putting of prices.

### Cleaning and Counting.

After arranging, the porters go through the entire building from roof to cellar, dusting, cleaning thoroughly, weighing and counting each item and marking it either with chalk or slips of paper. The time used in this preliminary work is well spent.

### Inventory Sheets.

Instead of taking down in a book, use sheets of paper of uniform size and ruled for two columns of figures. These sheets are numbered 1, 2, 3, 4, &c., up to 100, or as many as are needful. Hand these to the men who are to do the work, keeping a record of the numbers given to each, and see that they are returned, whether used or not. By this record you may know that no sheets are lost. Only one side of the sheet is to be written on. Two men work together, one to take down, while the other does the counting, weighing and calling off. Assign your men to different parts of the stock or different floors, so the work goes on at several places at the same time. On account of the arranging of the goods, all goods of a kind can be taken on consecutive

sheets. This is of very great importance, if lists and discounts are used in pricing. All large articles, as Stoves, Mantels, Furnaces, Tin Plate, &c., are invoiced first and each marked with chalk as soon as it is taken.

### Putting Prices.

This is tedious work where the utmost care, labor and time is needed. As soon as a few sheets are filled they are handed back to the office so the pricing can begin about an hour or two after the invoicing is begun. After all pages are priced, they should be marked O. K. by a second person. Next the extensions are made, each in turn being marked O. K. by a second person. Then additions are made and marked O. K. Thus each step is O. K. before the next step is taken. By using separate sheets all the work can be carried on at the same time by a half dozen or more clerks, and therein lies the great saving of time. Always use lists and discounts in preference to net costs.

### Binding.

When these sheets are completed they are bound in a permanent form by blocking them with mucilage at the top. They are then handled as easily as any book and can be referred to as quickly.

### Goods Sold After Inventory.

A record of all goods sold after they have been invoiced must be kept and their value subtracted from the total inventory.

### En Route.

Goods *en route*, which have been journalized, must be invoiced from the file on which these invoices are kept.

### Summary.

For the sake of comparison, make a summary of the amounts of each kind of goods shown on the inventory. This is done by ruling one of the sheets with spaces for names and amounts like the following, reserving spaces for entries for several years to come :

	1893.	1894.	1895.	Etc.
Stoves . . . . .	\$2,178	\$1,907		
Tin plate . . . . .	1,104	882		
Mantels . . . . .	807	750		
Furnaces . . . . .	614	600		
Stamped ware, &c. . .	554	425		

Bind the summary with the other sheets and it will be a source of interest and will repay the little cost to make. By it you can tell the amount you have invested in each kind of goods, and it will be a guide to you when you wish to even up stock.

### Old Stock.

Don't fail to go carefully over the inventory and make a list of the old and odd stock which you wish to get rid of. Put low prices on such goods. Tack a copy of them in a conspicuous place in the office and paste another copy in the cost book.

If possible put the goods themselves in a conspicuous place, remembering the old adage, "Out of sight, out of mind." Use your best efforts to push them off. Better lose money on them promptly than allow them to become shopworn while costing you interest to carry them.

These suggestions may have to be modified to suit varying conditions, but we find the plan has worked entirely satisfactorily with us.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### Buyers and Buyers.

A correspondent commenting upon the question, Was the buyer right or was he wrong? which appeared under the above heading in our last issue, remarks as follows :

Right, if the man was selling a new Sash Balance; wrong, if a new Lock, as he described.

If he was right, many articles of real merit would never have found a market, never been improved, and the same Mr. Buyer would not now be living in a progressive age. The writer has found by experience that a new Parlor Door Hanger, Sash Lock, Door Check and Spring, Double Spring Hinge and like goods had better be introduced by the manufacturer or patentee than by the retail merchant. When architects specify these goods, and create a demand for them, it is time enough to buy them, and then only with caution. As a rule, the retailer is safe in buying new Tools and many other goods, always using good horse sense when taking hold of anything new. Many new articles of merit need no introducing, selling on sight; other new goods, as Aluminum Kitchen Utensils, will sell by educating the trade into

buying them. Again, you will have to chance your judgment in buying new Post Diggers, Wire Stretchers, Cattle Ties, Hay Knives, &c., one farmer agreeing with you, another against you.

It is folly for the retailer who has a trade that wants Putnam Horse Nails, Heller's Rasps or Batcheller Hay Forks, to try and introduce other makes, unless he is satisfied they are as good and can make more money on them.

Many new articles of merit are never sold because never shown, your trade being ignorant of such an article on the market.

Use good judgment in buying new articles. Avoid large quantities. Show to your trade and educate them in their use and merits, and, with prices right, you need not have many unsalable new things.

### Enterprise and Ingenuity in Window Display.

The following communication refers to methods adopted by an enterprising house in making a window display with the effect of attracting much attention. It may interest our readers as suggesting the advisability of using the win-



dow of a Hardware store more effectively than is frequently the case:

Enterprising and aggressive merchants are continually devising schemes for advertising and attracting the attention of the public to their wares. Some dress their windows handsomely at frequent intervals, and at night brilliantly illuminate the whole with a flood of electric light, whether the store be open or closed. This is becoming more the custom as time passes, the old time tradesman often failing to realize how his progressive competitor is fast leaving him behind with his untidy stock and slovenly windows, which, like the famed ancient laws, never change.

Others, instead of relying on the cutting of prices to bring business, raise the quality without increasing the price, and in various other ways perfect their system and offer extra inducements to stimulate trade, which, while lessening the margin of profit, to be sure, increases the volume of it.

We observed recently a device of an ingenious and attractive character designed to draw attention to a late invention of Thomas A. Edison. A large bed of American Beauty roses, surrounded by a wreath of ivy, was appropriately mounted on a circular board about 20 inches in diameter. Imbedded among the roses were about 40 or more miniature electric lamps with ground bulbs, which when the current was turned on produced a striking effect. Indeed the custodian of one of the largest office buildings where it was hung in a store window remarked it was a nuisance, as so many passers gathered to admire it, obstructing the passage. Doubtless the originator of it would have appreciated the compliment. It might be added that the flowers, &c., were clever imitations and not perishable.

All this is of course pretty complicated and expensive for the average Hardwareman, but we send you the suggestion as enforcing the wisdom of making a window display *that will attract the people*.

### The Bicycle Problem.

The Bicycle problem in our last issue has awakened a good deal of interest, and most of our readers who have looked into the matter carefully have been surprised at the result. One correspondent advises us that the Bicycle will stand still. The following solution comes to us from Pittsburgh:

**PROBLEM 1.**—Pullee back on stling, Bike pullee back too. Pedal go flont. Wen pedal slait flont, pullee all come make Bike lun back. No count flic-tion. Sabee? HE NO.

Or, in English as she is spoke:

The stress of the pull draws the Bike in its direction proportionately as the respective "lever arms" (length of pedal crank and radius of hind wheel) in opposition. When the pedal gets dead forward, the entire "pullee" is represented in the "kinetic energy" of the moving Bike.

BLACKSBURG PITTSBURGH.

**THE STANDARD SCALE & SUPPLY COMPANY**, with factory at Bellefonte, Pa., and general office at Pittsburgh, have established a branch office at 135 South Fourth street, Philadelphia. This company are manufacturers of Railroad, Wagon, Coal, Hay, Rolling Mill, Blast Furnace, Dormant, Portable, Counter and Fine Scales for every purpose, and have received testimonials from some well known concerns on the satisfaction with which their Scales have been employed.

## Bicycle Repair Shops

In Connection with Hardware Stores.

**N**OTHING will attract and conserve a desirable retail Cycle trade like facility in doing prompt and reliable repairing. To Hardware houses which have added Bicycles to their business as a permanent feature, it is wisdom to at once hire a competent man to take charge of this department and put in those tools which his experience may suggest.

### Qualifications.

Every mechanic or machinist is not competent to do general repairing or take charge of a repair shop, as the proper conduct of this department requires the attention of a man whose brain is above that of the average factory mechanic in quality. He should possess the ability of an emergency doctor, and be able to see at a glance what is required to repair any of the many accidents which may happen to a Bicycle, and be able to do the necessary work on short notice. If his charge be a large one he must possess a good memory, and be correct and methodical in making his charges and keeping records of them, and where assistants are employed he should scrupulously inspect all work not done by his own hands. Added to this, it is advisable to be firm but courteous with customers, bearing in mind that the Bicycle rider will, as a rule, make more trouble over paying 5 cents for a repair on his wheel than he would \$5 for the same value of repair on his watch.

To enable this man to make his department profitable, allow him to have the

### Necessary Tools.

The proverb that time is money is nowhere more true than in the repair shop in riding season. Riders will not wait like ordinary mortals; they are notoriously unreasonable on this point, grudging every second of time; therefore a good supply of tools to enable the operator to do his work quickly will easily pay for itself. The large tools necessary are forge and blower for brazing and forging special parts for repair, or where gas is used a duplex nozzle of  $\frac{1}{2}$  or  $\frac{3}{4}$  inch diameter with fire brick or charcoal as an accumulator of heat, a metal stand for same, with hole in center to allow for the brazing of tube in a vertical position. A screw-cutting lathe, 5-foot bed, and swing enough to take a Bicycle crank—the largest piece used on a Bicycle which requires lathe work. Wheel truing stand and heavy swivel jaw vise. The smaller tools are tire testing tank, large floor pump, files, drills, taps, dies, hack saws, &c. Supplies: Tire cement, shellac, air drying enamel, brazing, spelter, bolts and nuts, small quantity of various sizes of tube. All these parts Hardware stores can furnish to their repair

shop at trade rates, while the exclusive Cycle agents pay retail prices, a point in favor of the Hardware man.

### Business System.

A proper system of checking wheels and parts should be employed—the most convenient form of check being a tag and coupon printed in one, with a perforated dividing line between them and both parts bearing the same number. The tag is filled out with the repairs necessary—owner's name, date of receipt—and on the coupon, which goes to the owner of the article, is written the time when it will be ready and price of job, if it can be given. The tag is tied to the article and the coupon given to the owner. All transactions should be entered in a Repair Book for easy reference and the tags filed when goods are delivered. All repairs should be cash. For the guidance of those who desire a tag form I suggest styles which I have filled out to show the method.

<b>PLYMOUTH HARDWARE CO.</b>	
REPAIR NO. <u>41.</u>	
ARTICLE	<u>Rear Wheel.</u>
DATE RECEIVED	<u>Nov. 17, '94.</u>
EX. PAID	<u>75c.</u>
OWNER	<u>James Green,</u>
	<u>Leeds, Ohio.</u>
PROMISED	<u>Nov. 23d.</u>
RECEIVED	<u>W. Armstrong.*</u>
NEW PARTS SUPPLIED.	
<u>1 Sprocket Screw, 6 Spokes.</u>	
<u>3 Nipples. 1 Rim.</u>	
LABOR	<u>5 hours.</u>
TOTAL CHARGES	<u>\$5.85.</u>
REPAIR NO. <u>41.</u>	
This coupon identifies your goods.	
WILL BE DONE	<u>Nov. 23d.</u>
CHARGES	<u>\$5.85.</u>
STORAGE CHARGED 25 CENTS PER WEEK AFTER	<u>Nov. 30.</u>
PLYMOUTH HARDWARE CO.	

\* Name of party who takes repaired goods away.

This tag will, I think, meet every requirement in the repair shop and relieve the head man of considerable worry.

### Repairing Tires.

Tire repairing is now an important item in the repairer's accounts. This

class of work calls for greater skill than may be supposed, and more time can be used in repairing a tire when not properly set about than the average rider cares to pay for. Owing to the great variety of tires now in use, each requiring a different system of repairing, it is impossible to outline the work here.

#### Stock of Parts.

Some parts of Bicycles are more likely to become damaged by accident and wear than others, and I suggest that a small stock of these parts of the wheels handled be kept on hand, these to consist of spokes, nipples, crank keys and nuts, cones and balls, also air tubes and valve parts of the styles of tires in use.

#### Order in the Shop.

In some repair shops tools and parts are lying around in every corner, a perfect chaos, and the poor careless workman hunting around for every tool or part he needs wastes a good deal of precious time. Racks should be placed above or within easy reach of the work bench in which all small tools can be hung and seen at a glance, trays with divisions in them for screws, nuts, balls, nipples and other small parts should be used; thus, if the repairer will only be orderly, he will find his work more easily accomplished, and he can therefore get through more of it per diem, to the financial advantage of his employer. A place for everything and everything in its place, should be his motto.

#### Work in Winter.

In winter if your repair man is not utilized in the store, his time can be profitably employed in putting together a few Bicycles for sale in the ensuing spring. The necessary parts in rough for building very durable wheels can be purchased from a dozen or more makers of Cycle fittings in the country, as will be seen by the advertisements in the various Cycle trade journals, and although the wheels may not be as highly finished as the factory made article, customers are sure to turn up for them. This work will at least enable you to keep your repairer in work through the winter without losing money on his department.

In conclusion, I consider that a properly conducted Bicycle repair shop in connection with the Hardware store is a means of attracting and retaining retail Cycle trade, and will pay well in any fair sized town where cycling is popular, and should, therefore, be favorably considered by Hardware houses handling Bicycles.

WIEBUSCH & HILGER, 84 and 86 Chambers street, New York, have issued the list of German Chain, August 28, with descriptions of the different Cow Ties covered by it instead of numbers.

THE GEO. W. STANLEY COMPANY, successors to Stanley Tack Works, Belleville, Ill., advise us that in addition to goods well known to the trade, they are now making a full line of Double Pointed Tacks. The latter are furnished in papers and bulk.

## The Clerks' Hardware Club.

BY ONE OF THE MEMBERS.

THE MONTHLY MEETING of the club was held in their rooms on November 1, the attendance of most of the members indicating their interest in the association. The members who had prepared papers gave way to a visitor from Chicago, introduced as an employee who had something to say on methods of business pursued in that progressive city. His subject was

#### Holiday Business.

He prefaced his remarks by saying that clerks usually expected to become proprietors, and to such ambitious members he would address himself. After reviewing the causes that decided his firm to add toys to their stock, for the holidays only, he continued:

There is a more intimate connection between the Hardware business and a line of toys than might at first be supposed. The contents of a \$1 tool chest is an object lesson, and the parent's gift to his boy has swelled, indirectly, many a day's sales. Iron enters largely into the composition of some toys, and entirely in many. It is the idea, considered as a whole, that leaves the impression of a loss of tone by such an addition to one's stock.

#### Purchasing the Stock

from a jobber in toys, we bought a bill amounting to \$500, a load for a two-horse wagon, consisting of iron, tin mechanical and wooden toys, iron and wooden wagons, and doll gigs, omitting dolls except a few of rubber.

The goods were delivered the 1st day of December, the work of arranging commencing at once. When marked they were placed on temporary shelving attached to shelf brackets extending from the regular shelving and running in three tiers above the counter ledge, the first shelf being 12 inches wide, second 9 inches and third 6 inches, a bright colored curtain separating the shelf goods from the toys. In the center of the room a combination of tables and boards extended the whole length; upon this the larger toys were arranged. By the 10th of the month the window was trimmed and we were ready for business.

#### Advertising.

The largest delivery wagon was filled with sleds, wagons, doll gigs, &c., with large oil cloth signs on the sides announcing the new departure. With two horses a tour was made of the streets. About the 18th of the month a boy costumed as Santa Claus was added to the wagon and two more horses to the other team. From time to time Santa would distribute handfuls of penny toys to the children who crowded so closely around the wagon as almost to endanger their lives. In the window several mechanical toys kept a crowd around it continually, while in the store a large music box increased the liveliness.

#### Daily Sales.

The sales ran from \$50 a day, two weeks before Christmas, to \$325 the last day, the 24th. The children came the first week to see, the parents the second week to buy. The bringing to the store of such unusual crowds boomed the standard holiday lines, Carvers and Pocket Cutlery taking the lead.

#### Attention to Details.

Working out the details of such a departure kept our force constantly

employed, the last week keeping them up every night until 12 o'clock. The offering of cash prizes for the largest sales made proved an incentive that kept them interested. Thus a departure from the beaten track has, with the return of the holidays, become a part of our business, bringing to us new people, who become, during the year, customers of our staple articles, amply supplying the possible loss of tone or dignity by a positive addition of the dollars.

#### The Discussion.

In the informal discussion which followed the reading of this paper the following points were emphasized: The success of new departures depends upon being first in the field; upon getting close to the people and giving close attention to details. This brought forth a request for a definition of "Detail," as applied in the business world.

Synthetically considered, said Mr. A., department manager, every business is composed of minute portions, and becomes a combination of particulars. The larger the business the greater the combination, and what to one is a detail or particular, becomes to another the general or entire business. The ordinary clerk knows little, and appreciates less, the qualities needed in the management of a business; he draws his weekly wages for his more or less close attention to the details intrusted to his care.

The most successful business man, and the one most respected by his employees, knows more than his clerks do about the details of their work; he is the master mind; to him knotty points are brought for solution. His province is the direction of affairs, the working out of the details for his employees.

Then my employer, said a bookkeeper, considers bookkeeping a detail? Exactly, was the reply. To illustrate: When approached by a traveler, T. R. Morgan, Sr., of the Morgan Engineering Company, said, "My son attends to the details." The important business of purchasing was to his master mind but a detail of the business.

Some practical suggestions were then made by the packer in regard to tying up packages neatly as a detail of business, in connection with which he illustrated a method of breaking the string by passing it around two fingers of the left hand and giving it a quick jerk. The remainder of the evening was spent in a social manner, after which the meeting adjourned.

## Trade Items.

A DECISION has been rendered by Judge Townsend sustaining three patents of the New Departure Bell Company, Bristol, Conn., against the Bevin Bros. Mfg. Company, East Hampton, Conn. The first patent, 456,062, relates to a peculiar form of striker in Bells; the second, 471,982, concerns their Bicycle Bell, and the remaining patent, 471,983, is in relation to the peculiar striker arm mechanism applicable more particularly to Door Bells. The opinion was filed in the clerk's office of the United States Circuit Court, at Hartford, Conn., November 19.

THE PIKE MFG. COMPANY of Pike Station, N. H., call attention in their advertisement on another page to the superior quality of Pike's Lily White Washita and Genuine Arkansas Oil Stones. They report an increasing export trade as evidence of the superiority of these goods over those of

foreign make. An illustration is also shown in the same advertisement of Pike's Natural Grit Carving Knife Hones.

THE BRYAN MFG. COMPANY, Bryan, Ohio, manufacturing the Champion Folding Barrows, allude to the fact that these Barrows are so packed and constructed that no parts can under any circumstances become lost or mislaid, a feature that will be appreciated by dealers generally. This feature applies to the company's full line. An additional improvement in the Champion Folding Barrow has been recently made in that the legs instead of being formed of flat bars are now made from angle iron, providing greater rigidity and strength.

GEORGE B. DARBY of Edward Darby & Sons, 235 Arch street, Philadelphia, Pa., is offering for sale the patent on the Ziegler Hook and Eye, for which special claims are made. The principal feature of the device is that it possesses a guard which overlaps the Hook, and thus prevents it catching in the trimmings, lace and other ornaments which are attached to the dress. It is stated that the guard also prevents the eye becoming unfastened. Mr. Darby, as intimated above, is offering the patent for sale, but is willing also to have the article manufactured on a royalty. He will be pleased to answer inquiries.

THE MORFORD REGISTER COMPANY, Allentown, Pa., in their advertisement in this issue, show an illustration of their Safety Cash Till. The Till is referred to as being made with quartered oak or black walnut fronts, and as containing 14 compartments for coin and bills. A feature of the Till is the construction of the lock, which is so arranged that it rings an alarm either when the right or wrong keys are pulled and every time the drawer is opened. A patent was allowed the company on the Till, July 10, 1894.

EMPIRE FORGE COMPANY, Lansingburg, N. Y., announce December 1 that hereafter Wier & Wilson, 14 West German street, Baltimore, will represent them as sales agents for the Southern States, and all orders from that territory will be referred to their office. The company's goods include Portable Forges, Sash Pulleys, Geo. Washington Hatchets, Yankee Ice Picks, Daubers, Stencil Brushes, Cork Screws, Razor Strops, &c.

HAMSLEY METAL ROOFING COMPANY, 18 Cliff street, New York, have been appointed agents for the Wheeling Corrugating Company for New York and nearby territory. They are prepared to deliver from stock or mill direct. They will carry all stock sizes in 6, 7, 8 and 10-foot lengths V shaped Crimped Roofing, Pressed Standing Seam, Clapboards or Weather Boarding, Black or Galvanized Rock Faced and Brick Siding and Corrugated Iron. They will also handle Metal Shingles, Cornices, Skylights, &c., in conjunction with the above. The company have just completed a rock face front for a large dry goods building at Long Branch, N. J., together with a similar front for an office building at Red Bank, N. J.

### Price-Lists, Circulars, &c.

THE WÜHLER ALUMINUM COMPANY, 55 Jackson street, Chicago: Catalogue of Aluminum Ingots and general Aluminum products. This is an 88 page catalogue whose contents will be a revelation to many persons who are not thoroughly informed as to the progress made in the introduction of Aluminum to general use. This catalogue covers an enormous variety of articles ranging from kitchen ware to

personal ornaments and extending to building material. The company state that they are prepared to furnish Ingots, Plates, Sheets, Bars, Tubing, Wire, Corrugated Sheets, Roof Gutters, Conductor Pipe, Finales, Ceilings, Perforated Sheets, Distilling Utensils, Steam Jacketed Kettles, &c. In smaller wares they show Art Castings. Trays of many patterns and sizes, Desk and Table Ornaments. Fob Chains made of Aluminum Web. Toilet Articles. Flat and Hollow Table Ware, Fancy Mugs, a very complete line of Cooking Utensils and articles of general Hardware for which this metal is suitable.

ILLINOIS REFRIGERATOR COMPANY, 909 Masonic Temple, Chicago: Illustrated catalogue and price list for the season of 1895. This is an unusually fine catalogue, forming the company's third annual. Very great pains are taken to acquaint the reader thoroughly upon the special features and merits of their goods. The first 13 pages are devoted to explanations of the methods of construction, system of circulation, cleanliness, insulation, &c. Solid bronze Hardware is used, of highly ornamental design, and the lock and strike are provided with a wedging power of over  $\frac{1}{8}$  inch. The provision shelves are made of double woven wire attached to a substantial iron frame, galvanized after being made. The Refrigerators illustrated are presented under the name Automatic. The ice chamber is placed at the side of the refrigerator, extending from top to bottom, and connected with the provision chamber at the top and the bottom, thus securing a positive circulation. A great variety of styles is shown, comprising plain domestic, sideboard, grocers', hotel and apartment house.

THE GOULDS MFG. COMPANY, Seneca Falls, N. Y., and 16 Murray street, New York: Pumps and Hydraulic Machinery. An illustrated circular and price-list shows recent additions to their line, including Empire Double Acting Well Force Pumps, in a variety of styles; Anti-Freezing Force Pumps, New Well Pump Standards, Anti-Freezing Windmill Pumps, Plumbers' Brass Force Pump, Brass Lift and Force Pump, Semi-Rotary Clock Force Pump, Suction and Force Pump, Double Acting or Garden Fire Engine, Bicycle Pumps, &c.

PARRY MFG. COMPANY, Indianapolis, Ind.: Light Vehicles. The company have prepared advance cards in pamphlet form, representing a personal interview with a salesman. A picture of the salesman is given on each of the right hand pages, and a cut of some vehicle or part of a vehicle on the pages opposite, the advantages of which the salesman is calling attention to. Books of this kind, we are advised, have been prepared for each of their salesmen, and offer an example of advertising somewhat out of the usual line.

F. S. ANDERSON COMPANY, Richmond, Ind.: Lawn Mowers. The Mowers shown in their 1895 catalogue include the Paragon, Yale, Best High Grass, Ball Bearing, Columbia, Best and Style K. The company state that they are constantly adding to their plant, with the view to more rapid and better production of their goods, and that they are also adding new styles to their regular line of Mowers.

T. F. WELCH & Co., 65 Sudbury street, Boston, Mass.: Hardware and Tools, Gears and Gear Cutting. Illustrations and prices are given of Finished Brass Spur Gears, Iron Cast Spur Gears, Brass Ratchets, Chain Wheels and Chain, Knurls or Milling Wheels, Close and Open Springs, Small Steel Lathe Dogs, Twine Cutter, Small Iron

Hand Screws, Adjustable Steel Tap Wrench, Bench Lathe, Countershaft, Iron Pulleys, Brass Thumb Screws, &c.

ETTE & HENGER MFG. COMPANY, St. Louis, Mo.: Lawn Sprinklers and Hose Specialties. An illustrated catalogue devoted to these lines of goods shows the Cactus, Japanese and Park Lawn Sprinklers, and the Imperial, National and Pacific, these three having revolving arms. The Hose Specialties illustrated include Brass Polished Hose Pipe, National and Gem Spray Nozzles, Hose Couplings and Clamps, Seamless Hose Valves, also California and Chicago Patterns of Hose Valves.

GOODELL COMPANY, Antrim, N. H.: Butcher Knives and Steels. A circular illustrates the company's Steer Head Brand of Butcher Knives and Magnetic Butcher Steels. The Knives are shown in butcher, skinning, sticking and boning styles, all having riveted beech handles. The Steels have cocobolo, stag horn and rubber handles.

### It Is Reported—

#### Arkansas.

That McNabb Bros., at HUNTINGTON, are closing out their stock of goods.

That J. W. Newport is the proprietor of a new Hardware store, at EUREKA SPRINGS.

#### California.

That the warehouse of the Linder Hardware Company, SAN JOSE, was recently destroyed by fire.

#### Connecticut.

That F. S. Bidwell's Hardware store, at WINDSOR LOCKS, is undergoing improvements. The front has been taken out, and large plate glass windows will be put in, as well as a new doorway. Alterations in the interior appearance of the store are also making.

That Joseph Jones of HARTFORD has opened a Stove and Tinware store, at BROAD BROOK.

#### Georgia.

That Royal & Slusses, dealers in Stoves and Tinware, HAWKINSVILLE, have been succeeded by W. E. Greyson.

#### Kentucky.

That James Butler is successor to the Hardware firm of Miller & Butler, MILLERSBURG.

#### Illinois.

That William McNeil has opened a Hardware store at Sterling.

That Hughes & Rowley, in the Hardware business at ATHENS, have sold out.

That the Hummell Hardware stock, at LINCOLN, has been sold out.

That Gottlieb Gmelich has sold his Hardware business, at PERU, to Henry Sperber.

That the S. J. Stebbins Company, CHICAGO, have been incorporated with a capital stock of \$35,000. The company will deal in Hardware. The directors are S. J., O. B. and Charles A. Stebbins.

That Mr. Larson of Clinton Junction, Wis., has purchased the Hardware store of A. S. Hewitt, ROCKFORD, and has taken possession. Mr. Larson controls two Hardware stores in Wisconsin.

#### Indiana.

That Armstrong, Ellis & Simmons are a new Hardware firm at KOKOMO.

That Dr. Harvey G. Carey has retired from the Van Camp Hardware & Iron Company of INDIANAPOLIS, Courtlandt Van Camp and David D. Burgunthal having purchased his interest. Mr. Carey has been a member of the company since it was organized, and has withdrawn on account of ill health.

#### Iowa.

That S. C. Bloom & Son, Hardware,

&c., CARSON, recently sustained a fire loss.

That Tatum Bros., Hardware and Implements, OCHEYEDAN, have sold out.

That J. W. Matthews, Hardware dealer at FORT MADISON, has sold out his business to Messrs. Kelly and Rehn of Axtell, Kan.

That the Gillette Bros. Hardware Stock, SIOUX CITY, has been sold out.

#### Kansas.

That Baxter & Fisher in the Hardware business at REPUBLIC have dissolved partnership.

That the stock of Pratt Hardware & Implement Company, PRATT, has been purchased by Hopper & Elliott.

That B. F. Zook, Hardware dealer, at MILAN suffered a fire loss of \$3000, on the 16th ult. Mr. Zook carried an insurance of \$1000.

#### Maine.

That the Hardware firm of Ridley & Jones, BRUNSWICK, has been dissolved.

That J. A. Griffin of YARMOUTH, is intending soon to take a partner in his Hardware business. Mr. Griffin will remove to larger quarters at an early date.

#### Massachusetts.

That Joseph W. McGilvray, in the Hardware business at LYNN, has suffered a fire loss.

That J. T. Leahy, formerly with William H. Estes, FALL RIVER, has opened a store at 26 Fourth street, and is carrying a line of Stoves.

#### Michigan.

That the Hardware firm of Bradl & Zeber, LUDINGTON has been dissolved.

That O. C. Martin, in the Hardware business, at BUTTERNUT, has closed out his stock.

That A. Bennett & Co., Hardware, SHERMAN, have been succeeded by B. H. Rose.

#### Minnesota.

That W. H. L. Donaldson of PRESTON has sold out his Hardware business and will remove to Minneapolis. He has recently been granted a patent on a new style of furnace.

That Wm. Lockwood of EDGERTON is selling out his Hardware stock.

That W. C. Snow, LE SUEUR, has closed out his stock to J. R. S. Cosgrove and W. H. Tomlinson, Hardware merchants of that place.

That S. W. Laythe of KIMBRAE has sold out his Hardware store to K. C. Jackson.

#### Mississippi.

That D. Street has sold out his Hardware business at CORINTH.

#### Missouri.

That C. A. Gilliland, Hardware, KINGSTON, has sold out.

That T. R. Landrum's Hardware and Implement establishment, at WAVERLY, was recently damaged by fire to the extent of \$1500; insurance, \$700.

That J. P. Reed is successor of Reed & Dunn, Hardware dealers, JAMESON.

That the Sedalia Hardware Company, SEDALIA, have been incorporated by John M. Delby and Herold and R. W. Griffith, with a capital stock of \$15,000.

That John Whitelaw's Hardware store at KIDDER was burglarized a short time since.

#### Nebraska.

That John Cloos has sold his Hardware store, at SUPERIOR, and has removed to FREMONT, where he will hereafter reside. Mr. Cloos has accepted a position with the Simmons Hardware Company of St. Louis as traveling salesman.

#### New Hampshire.

That the Hardware store of Curtice, Read & Co., CONTOCOOK, was burglarized on the 27th ult. Several hundred dollars' worth of goods were stolen.

#### New York.

That the Hardware house of W. J. & George Hall, LUZERNE, have sold out to Benjamin Jenkins, Jr., of CONKLINGVILLE.

That C. M. Borden is considering the erection of a Hardware store at NOBLESVILLE.

That S. C. Tulley's Hardware stock, BERGEN, has been disposed of.

#### North Carolina.

That J. S. Dysart's Hardware store, at MARION, has been burned out.

That R. T. Mill & Co. have succeeded to the Hardware business of R. T. Joyce, MOUNT AIRY. Mr. Joyce will continue his business at PILOT MOUNTAIN.

#### North Dakota.

That Hance Bros., FARGO, are moving their stock to larger quarters.

#### Ohio.

That Carey F. Bloomershire, Hardware merchant of DAYTON, has sold out.

That R. C. Frederick's new Hardware store, at JOHNSTOWN, is nearing completion.

That W. W. Davison, Jr.'s Hardware store, at HARRISON, was robbed a short time since.

That B. H. Moore has sold his interest in the Hardware store of B. H. Moore & Co., CIRCLEVILLE, to Wm. Schleyer of COLUMBUS. Mr. Barrere will continue in the firm, the style of which will be Schleyer & Barrere.

That the Hardware business of W. A. Kehnast, DEFIANCE, has been merged into the firm of Wm. A. Kehnast & Co., Godfrey M. Watkins, Mr. Kehnast's son-in-law, having purchased an interest in the concern. Mr. Kehnast has been located at his present address for the past 25 years.

#### Oklahoma.

That M. Barnaby is now conducting the Hardware business formerly carried on under the style of Barnaby & Esser, EL RENO, having purchased his partner's interest.

#### Pennsylvania.

That F. G. Misser has sold out his Hardware business at LANCASTER.

That Olden & Mitchell, Hardware merchants, of PHILADELPHIA, have disposed of their business.

That the Hardware store of Bovard, Seyfang & Co., PITTSBURGH, has been destroyed by fire.

That the Hardware firm of A. P. Buckholdt & Son, GROVE CITY, has been dissolved. The business will be continued by a new firm under the style of Buckholdt & Kohlmeyer.

#### South Carolina.

That Brunson & Bros. have opened a Hardware and Furniture store at ORANGEBURG.

#### South Dakota.

That in a large fire at WHITE, on the 21st ult., the Hardware establishment of Allison & Burgess was destroyed.

#### Tennessee.

That Wright & Madison, Hardware merchants, MADISONVILLE, have sold out.

That the store of J. T. Williams, at NASHVILLE, was robbed of a quantity of Hardware on the night of the 27th ult.

#### Vermont.

That W. Ladd of ENOSBURGH has moved to RICHFORD, where he has bought an interest in the Hardware business of H. C. Ayer.

That J. C. Eaton & Co.'s Hardware store, at LYNDONVILLE, was consumed in a large fire on the 27th ult.

#### Virginia.

That James & Wylie have succeeded the Hardware firm of Wylie & Thomas, at SALEM.

That the Hardware concerns of J. M. Shafer and Martin & Co., at LYNCHBURG, are closing out.

#### Washington.

That the Hardware store of Lawrence Bros., TACOMA, was robbed on the 26th ult. Goods to the value of \$125 were taken away.

#### Wisconsin.

That Williams & Rawson, PLAINFIELD, have dissolved partnership.

That Otis & Son, Hardware dealers, of HUDSON, have sold their stock, including a full line of Tinnern's Tools, to Oliver Bros. of the same place.

*The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.*

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

**White Lead.**—The position is practically the same as it was a week ago. There is quite as varied competition, fully as much persistency on the part of sellers of foreign product, no retreat as far as home manufacturers of quick process and mixed Leads are concerned, nor lack of strong circumstantial evidence that the combined corrodors will meet all comers. This means nothing if not that Paint dealers and painters who keep track of the situation should be able to buy at exceptionally low prices. Besides the many sided competition there is something to their advantage in the fact that crude material is being secured at remarkably low cost. Common quotations at present are 4¢, net cash, for Dry Lead and 5½¢ for Lead in Oil where lots of 25 tons or more are involved, and rumor has it that business has been solicited at a fraction less. Corresponding low prices are not made on small quantities, but the jobbing branch of the market is unsettled and affected more or less by offerings of moderated quantities of foreign Lead at comparatively low rates for future delivery. Business is moderate at the present time, since buyers generally are inclined to await developments in the absence of urgent needs. Upon the whole it looks very much like a buyers' market.

**Red Lead.**—No change for the better has taken place. It is not clear that affairs have turned decidedly for the worse, but the canvass for orders for foreign brands is conducted in an aggressive manner that is at least suggestive of determined effort to secure business. The price generally asked for future shipments is 5¼¢, but this would probably be shaded on lots of 25 to 50 tons. Small quantities bring about ½¢ more, ex store. Prices for domestic are adjusted to suit circumstances and, on actual business, come very close to those prevalent for foreign.

**Litharge.**—Deliveries on old contracts are slow, chiefly at request of the buyers. New business is moderate, no particular pressure to sell develops, but enough competition exists to keep prices uneven and rather weak. Low grades may easily be secured at 4¼¢, in round lots, for near future delivery. The high grades used in the Paint trade are quoted at 5½¢ upward, according to quantity, but the market is ragged and more or less weak.

**Orange Mineral.**—The demand for French continues very fair and prices remain steady at 8¼¢ for round lots to arrive, and at 8½¢ for jobbing store parcels. The stock of German on the



spot. for prompt delivery in first hands, is moderate and holders are able to obtain full figures. On the spot small sales are made at 7¢ @ 7½¢. To arrive, however, importers are quoting 6¼¢ @ 6½¢ for lots of 25 tons and upward. English is dull and held at 6¼¢ @ 7¢, as to brand and quantity. Domestic is selling in a small way at 6½¢ @ 6¾¢. less the usual discount.

**Zincs.**—Grinders are extremely indifferent about placing orders for American Oxide for delivery during the coming year. Producers have indirectly quoted lower prices, but the concession does not appear to have been attractive, although ¼¢ or more below those that have prevailed for some time past. German brands are lower, and, while 4¼¢ is the popular inside quotation, orders at 4¢ have been solicited. French is without quotable change in price and sells rather slowly.

**Colors, &c.**—Buyers have displayed very indifferent interest in Dry Colors, since market conditions present no incentive to purchasing except against immediate needs. As not unusual in a quiet period, some irregularities in prices occur, but no radical changes have taken place, and, upon the whole, the market shows quite steady tone. Practically the same remarks fittingly apply to Oil Colors and other ready mixed Paints than those which may be classed as specialties.

### Oils and Turpentine.

**Linseed Oil.**—At some interior points there has been a slight yielding on prices, but the sellers' terms were wholly in their favor, and the net result to the buyer in this quarter, at least, was no better than the prices and terms openly quoted by city crushers. On city makes there is no change whatever, and the market, generally speaking, retains very steady tone, although sales are rather slow, as usual at this season of the year. It is the general belief that prices will remain stationary during the balance of the year unless forced up by higher cost of raw material.

**Cotton Seed Oils.**—The market has been a sluggish and weak one. About 1¢ @ 1½¢ will cover the change in value, but slowness of business is quite as conspicuous as the fall in prices. Prime quality Crude Oil went to 24½¢ @ 25¢, prime Summer Yellow at 30¢, prime White at 32¢, and other grades at corresponding prices. Mill capacity and seed supply indicate that the out-turn of oil will be heavy this season.

**Lard Oil.**—Home dealers are buying in a limited way. Exporters are taking very little. In the aggregate, business is hardly up to the average for the season. Pressers have not forced stock upon the market, but supplies have come out from one quarter or other in sufficient quantity to keep prices rather weak. Prime city went at as low as 35¢ in moderate quantities, and 53¢ was accepted for reputable Western brands.

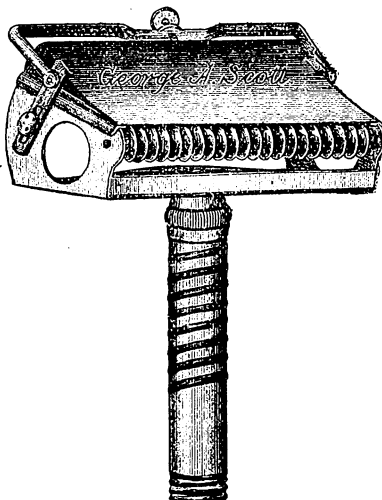
**Fish Oils.**—No change has taken place in the market for Crude Menhaden, Sperm or Whale Oils. Pressers naturally quote about former prices for their products. To that extent the market generally is steady. Business has been slow, however, and chiefly of retail character. Cod Oils are generally quoted at former prices, but concessions have been made to the extent of 2¢ per gallon on rates involving good sized lots, and the general market is showing rather weak tone.

**Spirits Turpentine.**—Prices have remained almost stationary all through the week, and the market has shown somewhat firmer undertone in consequence of better advices from lead-

ing Southern points. Supplies prove to be ample, however, and it is the exception that receivers have obtained over 27¾¢ for regular, or 28¢ for machine, barrels.

### Scott's Electric Safety Razor.

The Pall Mall Electric Association, New York, for whom Wiebusch & Hilger, 84 Chambers street, New York, are agents, are introducing a safety razor embodying improvements, as illustrated herewith. The blade is adjusted as to angle at the side by means of set screws, leaving the top surface clear. The blade is moved forward and held in position by a set screw at the top, in connection with a bail like fixture which is swung out of the way when removing the blade. The guard beneath the edge of the blade is cut in spiral shape and revolves as the shaving is done. It is claimed that the revolving guard prevents pulling the beard, and that it readily carries the lather underneath the frame. The frame is open at the back and has openings at the sides, which permits of the razor being easily cleaned. All parts are well finished and nickel plated, and each razor is accompanied



Scott's Electric Safety Razor.

by a blade holder for use in stropping. The handle is in two sections, and the frame is compact, allowing the razor to be packed in a comparatively small space. Each razor is put up in a neat tin box, 2½ inches long, 1½ inches high and ¾-inch wide. The smallness of the package is a feature emphasized by the manufacturers.

### Domestic Gas Light Heater and Illuminator.

Hamsley Metal Roofing Company, 18 Cliff street, New York, are marketing a modification of a heater formerly brought out by them, as shown in the accompanying cuts. It is known as the Domestic Gas Light Heater and is specially adapted for heating bath and bed rooms, offices, &c., affording both light and heat from one flame. The dome has an inside shell to retain any atoms of gas which may have escaped combustion at the burner and are consumed by the intense heat without fouling the atmosphere of the room. The sides of the lower half of the dome

are fitted with white mica for illuminating purposes. This heater is 7 inches in diameter and 10 inches long over all. When desired a hood or deflector is sent

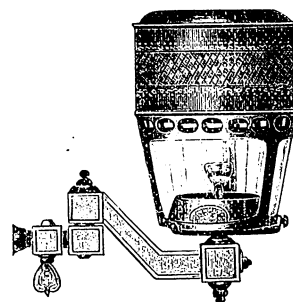


Fig. 1.—Domestic Heater with Single Burner.

which covers the dome, its object being to shower the heat downward. Water and other liquids can be quickly heated or light cooking accomplished over these heaters, a number of utensils fitting the top exactly being furnished for this purpose. Fig. 2 shows a

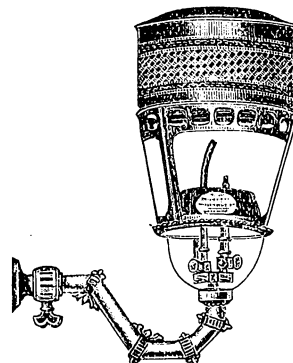


Fig. 2.—Heater with Double Burner.

double burner with air mixer, which, it is explained, gives a more intense heat, increasing the volume twofold for increased area or space. Fig. 3 represents the heater with double burner, the whole covered with an embossed

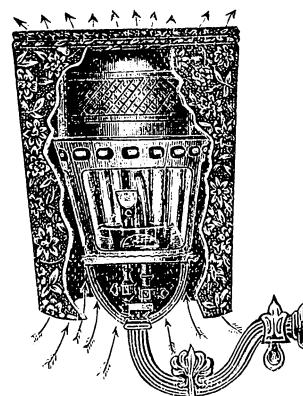


Fig. 3—Heater with Double Burner and Inclosure.

Russia iron inclosure 10 x 10 inches for radiating a greater supply of heat. One of the economies of the heater over a stove consists in the fact that it can be used or discontinued instantly, and the intensity of heat quickly regulated by the key.



**Boston Portable Vise.**

The Boston Portable Vise Company, 1390 Tremont street, Boston, are manufacturing a portable vise, as shown in

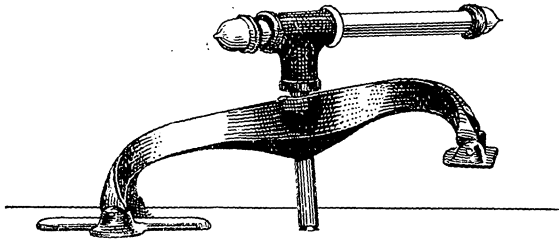


Fig. 1.—Boston Portable Vise.

Figs. 1 and 2. The tool is made of wrought iron entirely, with the exception of the sliding handle bar, which is of hardwood. The vise works in much the same manner as a letter press, as the lag screw on the lower part of the rod attached to the handle is turned into the bench or board upon which the vise is to be used. It is explained that the tool may be applied in or away from the shop to any table or surface, being easily adjusted by the lag screw, and that it will swing in any desired position. The makers claim that the vise can be used for all the purposes of a bench vise, as it holds wood or metal in the most convenient position possible for working; that it may be quickly attached or detached, and that it may be carried in an ordinary tool box, as it weighs complete but 6 pounds, and occupies a comparatively small space. The tool is de-

ened. The inventor has cleverly devised special fittings to cover every requirement in connecting garden hose. As will be seen by the cuts there are no screws to get out of order. The end of the male coupling is fitted with a

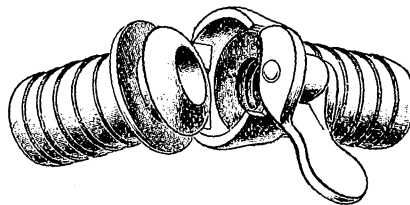


Fig. 1.—The Adams & Westlake Lightning Hose Coupling.

the couplings are connected the cam is inserted in the groove, and with one motion of the lever the two parts are

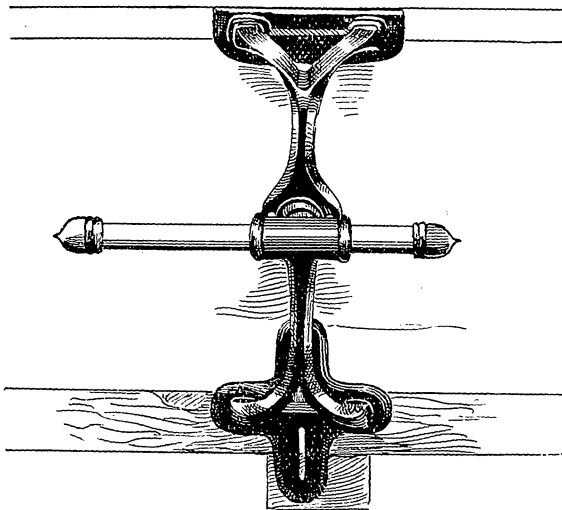


Fig. 2.—Top View of Boston Portable Vise.

igned for the use of carpenters, pattern makers, cabinet makers and wood workers generally.

**The Adams & Westlake Lightning Hose Coupler.**

The Adams & Westlake Company, Chicago, have just brought out the Adams & Westlake Lightning hose coupler, which is herewith illustrated. The coupler possesses obvious and important advantages over the old screw coupling. It has been devised to meet the demand for something better, for a coupling that can be used without bruising the fingers and without twisting the hose, that would be water tight and that could be instantaneously fast-

brought together perfectly tight, the curved top of the male coupling being pressed against a rubber washer on the

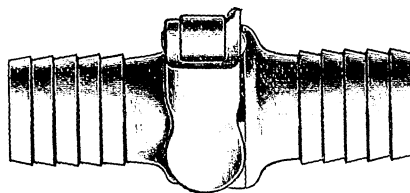


Fig. 2.—Couplings Connected.

inside of the female coupling, Fig. 2. The lever then lies flat on the side of the hose, as shown. Disconnecting is accomplished just as speedily and eas-

ily. Fittings are provided, as shown in the illustrations, for new hose, Fig. 3; for old hose without removing the old couplings, Fig. 4, and for use on a

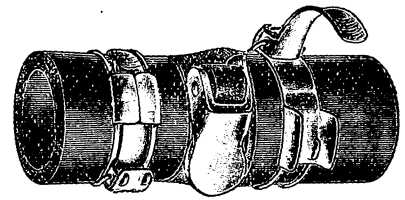


Fig. 3.—Coupling Applied to New Hose.

faucet, Figs. 5 and 6, where it can be left permanently. The A. & W. hose band, shown in Fig. 7, is also an ingenious device, as it can be applied without tools of any kind. It is formed with a body of wire, a brass strip at one

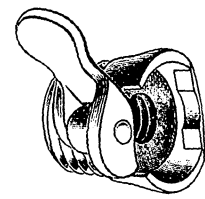


Fig. 4.—Coupling for Old Hose.

end and a lever at the other. Teeth on the end of the lever engage in openings on the end of the strip, and the band is then drawn tight by pressing the lever over. Ears on the strip are pressed

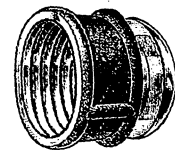


Fig. 5.—Coupling for Bibb Faucet.

down to lock the lever in place. It will be seen that with these hose bands the work of attaching couplings to hose is a very simple matter. In fact, the

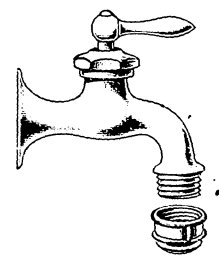


Fig. 6.—Coupling Applied to Bibb Faucet.

whole arrangement is wonderfully simple and well calculated to do away with much that is vexatious in handling

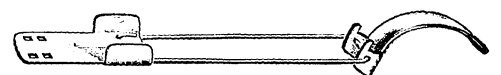


Fig. 7.—The A. & W. Hose Band.

garden hose. The company manufacture five sizes—namely, for  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , 2 and  $2\frac{1}{2}$  inch hose.

### The L. C. Smith Tire.

The accompanying cuts represent the L. C. Smith tire, offered by the L. C. Smith Tire Company, Syracuse, N. Y. The manufacturers explain that

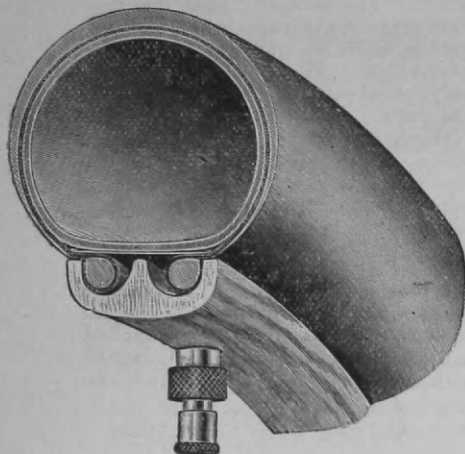


Fig. 1.—The L. C. Smith Tire.

the tire, in appearance, is not unlike the cemented tubular tire, and that it has the necessary resiliency, the inner tube being located entirely above the rim on a flat, endless locking band, which securely locks the shoe or outer

tire for wooden rims, and having been tested on both wood and steel rims, the makers offer it as an excellent, light and easily repaired tire.

### New Pipe Damper.

The Troy Nickel Works of Troy, N. Y., have just placed upon the market a

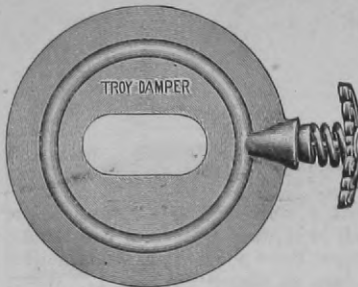


Fig. 1.—Stove Pipe Damper.

new damper, two varieties of which are shown in the accompanying illustrations. The damper is made of steel in such a way as to prevent warping. The spring in the handle is strong, and the

### The America Refrigerator.

The Bowen Mfg. Company of Fond du Lac, Wis., manufacturers of the Bowen patent refrigerators, have recently brought out the America, which is herewith illustrated. This refrigerator has a removable ice receptacle, thus constructed for the purpose of



Fig. 2.—Furnace Pipe Damper.

securing one of the essential features of a perfect refrigerator—namely, cleanliness. All parts are easily removed for cleaning, the interior being constructed entirely of metal with no wood exposed to become sour of filthy. The drainage is a special feature also. As seen by means of the broken side of the

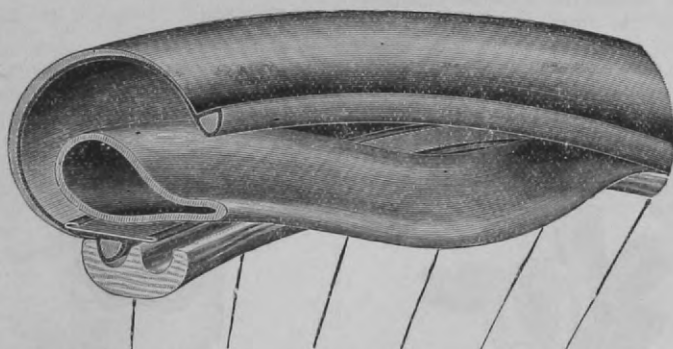


Fig. 2.—Tire Deflated for Repair.

cover in position, as shown in Fig. 1, thus protecting the rim from coming in contact with obstructions met with on the road. It is essentially a quick repair tire, it is stated, the manner of exposing the air tube for repair being shown in Fig. 2. This is accomplished

by deflating the tire, after which the locking band is shifted over to one side, and one edge of the shoe released. The point is made that while the tire is perfectly adapted to a hollow steel felloe, it is also a practical detachable



New Seamless Milk Can Neck.

manufacturers claim it will keep the damper in whatever position it may be placed. One of the special features to which attention is directed is that one hole only is required in the stove pipe, and this can be quickly punched by the most inexperienced. The special features of the damper are the subject of letters patent now pending.

### New Seamless Milk Can Neck.

The Chicago Stamping Company, Congress and Green streets, Chicago, have made a new departure in the milk can line, and are now manufacturing a seamless neck, which is herewith illustrated. In offering it to the trade the manufacturers enumerate a number of advantages, among which are the following: There are no seams to solder or to come unsoldered; it is always of one size and fit; there are no edges or joints to rust; no bowl to work loose; strengthens the weakest part of a can; is perfectly smooth inside and out. This neck is made of heavier material than pieced necks, and open hearth steel is used exclusively, in order to secure can stock that is proof against cracking. The company have just issued catalogue E, which covers their milk cans and milk can stock.



The America Refrigerator.

ice compartment, the tank walls are bent upward and inward at the lower ends, forming a continuous trough. This trough, having narrow channels, conveys the waste water out of the refrigerator with great rapidity. The ice rack, which is shown leaning against the refrigerator, is also constructed to attain this object. Dry air and saving of ice are the result. This method of construction also strengthens and stiffens the ice chamber. There is a large opening under the rack for the cold air

to enter the provision chamber, and there are spaces on all sides of the tank for the warm air to rise and enter the ice chamber. The metal ice compartment further forms a large condensing surface, which assists in drying the air. A portable drip pan suspended from the bottom of the tank makes it impossible for the moisture of condensation to drip into the provision chamber. The bottom and drip pan slope toward the waste pipe, which is located at the side

a malleable iron socket and is provided with a strong 4½-foot ash handle. The manufacturers state that for removing mud, slush, snow, &c., it is an excellent and cheap tool.

#### Victor New Model Crank Axle and Bearing.

The accompanying cuts represent a new crank axle and bearing which will

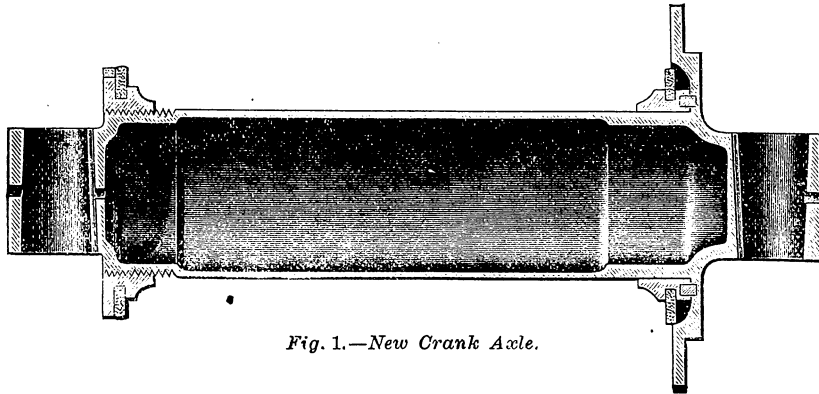


Fig. 1.—New Crank Axle.

of the refrigerator in a convenient place for observation and for the removal of the catch basin. On the right hand side of the ice chamber is seen the porcelain lined water cooler, which is

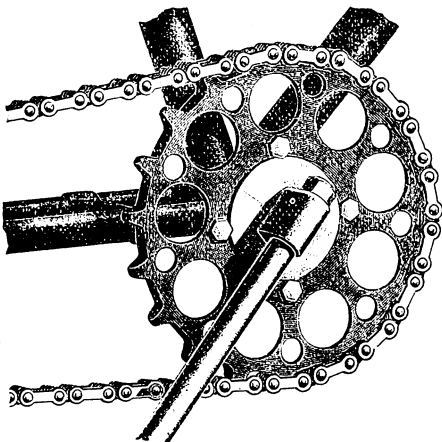


Fig. 2.—Crank and Sprocket.

hooked to a band of iron connecting the front and back walls and is easily removed for cleaning. The refrigerators are made of selected ash, finished in antique, trimmed with solid bronze hardware. Mineral wool is used for filling. The company also manufacture the Eclipse and Bowen refrigerators.

#### Walk and Street Scraper.

The Iowa Farming Tool Company, Fort Madison, Iowa, are introducing a

be used on all the Victor 1895 model wheels, manufactured by the Overman Wheel Company, Chicopee, Mass. The axle shown in Fig. 1 is in one piece instead of two, both the crank sockets being a part of the axle, so that there is nothing to work loose or give way. The axle is made hollow and its material so distributed as to best resist the strains put upon it by the rider. Increased lightness and strength are both obtained in the new form. The large bearings, it is claimed, run more easily

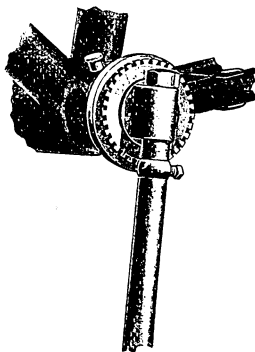


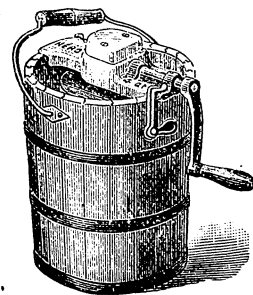
Fig. 3.—Crank Adjustment.

with less torsional strain, and at the same time give great stability to this part of the machine. This part of the machine is further improved by making the sprocket hub a part of the crank axle, Fig. 2, and doing away with the taper pin, or old crank key. The com-

In Fig. 3 is shown the manner in which the crank is adjusted. With the improved construction of crank axle the width of the tread has been greatly reduced, enabling the rider to give a more direct thrust upon the pedal, resulting in a more powerful and graceful action. The company state that they have made many experiments with regard to width of tread, and that they have adopted this as the best for speed, easy position, and for the wearing of the parts. A narrower tread, it is explained, results in undue torsional strain, a necessary shortening of the rear hub, and a consequent weakening of the entire driving apparatus, thus allowing the lower part of the frame to twist, while it is important that all these parts should be kept in a rigid line. It is further explained that with the Victor method of attaching cranks it is not necessary to shorten the distance between bearings at the hanger to obtain a narrower tread, and that the nearness of the bearings to the cranks is peculiar only to this construction.

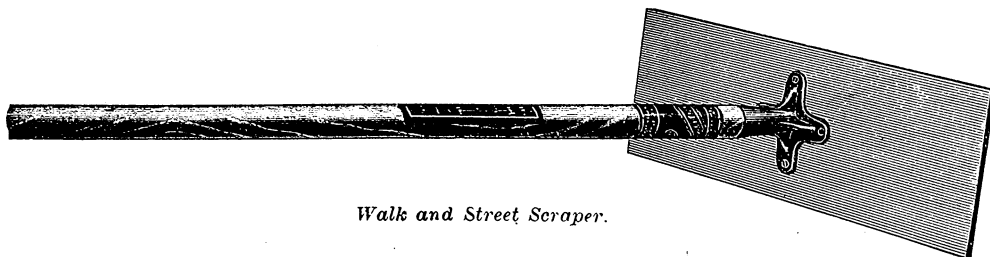
#### Hero Double Action Ice Cream Freezer.

The cut herewith shows a new ice cream freezer which Clement & Dunbar, 1129 Beach street, Philadelphia, are putting on the market as an addition to their line. The freezer is similar in construction to their well-known Home



Hero Double Action Ice Cream Freezer.

freezer, the exception being that it has a double action, one turn of the crank making an equal rotation of can and beater. The gearings are entirely covered, the cover being easily detached from the gear frame, as it is fastened by two bolts secured by two nuts. The gears are of uniform diameter, which makes the speed greater than can be attained by freezers having gears of unequal size. The tub is of white cedar, bound with galvanized flat hoops, the lower hoop affording ample protection to the bottom of the tub. All iron parts coming in contact with cream are



Walk and Street Scraper.

seasonable tool, as shown in the accompanying cut, for scraping walks and streets. The scraper has a hardwood blade, 6 x 18 inches in size, secured to

pany remark that this new construction is more simple, much safer, and much less liable to give the rider annoyance from any tendency to work loose.

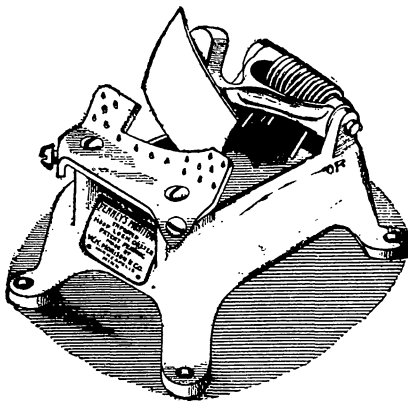
tinned, and the can is made of heavy tin plate with iron top and bottom. The freezer is made in sizes from 2-quart to 10-quart capacity.

### Improved Grooving Machine.

Jacob Brombacher's Sons, 30 Cliff street, New York, are marketing an improved groover for workers in tin, sheet iron and other metals, as here shown in Figs. 1 and 2. The work is grooved by moving the frame back and forth over the seam by means of the crank, the operator standing at the right hand end of the machine, in front of it. The upper and lower arms are made of bars of steel each  $2\frac{1}{2}$  and  $3\frac{1}{2}$  inches respectively, insuring great rigidity. The gear and rack teeth are all cut, affording a smooth movement. The seaming roll in the frame is followed by a flattening roll, thus completing the operation in one transit. A stop is placed on the top bar to prevent the frame running off the rack. The groover is so constructed that when lengths of 20 inches are to be grooved the lower bar can be built up with pieces of metal, regulated by an underneath set screw in the standard, so as to neutralize the inevitable springing of the bar at the extreme end of the groover. The groover is made in 20 and 30 inch sizes. In the 30-inch size the ordinary mechanism is provided for locking the upper and lower bars together. In grooving short lengths of material by setting the lower bar at a proper point, as indicated in Fig. 2, the workman is not compelled to change

### Penney's Monitor Improved Hoop Lock Cutter.

W. K. Morison & Co., Minneapolis, Minn., are offering an improved form of hoop lock cutter, as here illustrated.



Penney's Monitor Improved Hoop Lock Cutter.

The improvement consists in constructing the base open at the bottom, instead of closed, so that there is now no necessity of cutting the bench upon which the machine rests to allow clear-

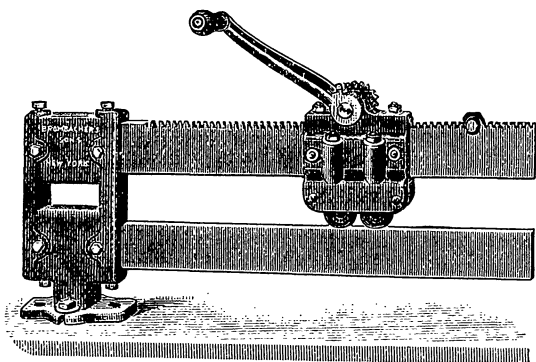


Fig. 1.—Improved Grooving Machine.

his position, even though the work is but a fraction of the groover's capacity. Three seaming rolls of varying widths,

ance for chips, as they can be easily removed. The shape of the knife and plate remains the same, as the manu-

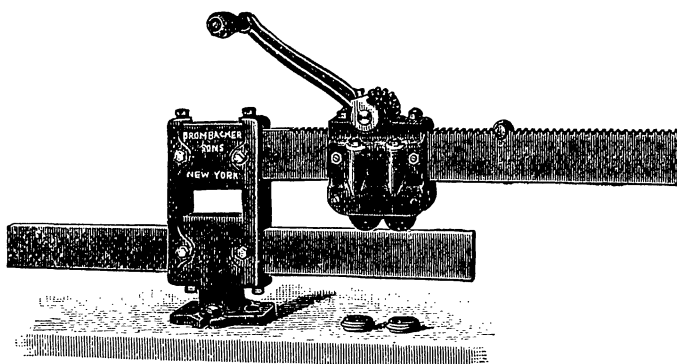


Fig. 2.—Showing Adjustment of Lower Bar.

together with a flattening roll, accompany each machine.

WIEBUSCH & HILGER, 84-86 Chambers street, New York, have been appointed sales agents for C. & A. Hoffman, Frankford, Philadelphia, Pa., manufacturers of Bell Brand Butchers' and Table Steels. The Steels are fully warranted and finished in a variety of handles, including polished blackwood, white beach, horn, enamel, rosewood, bone, stag, inlaid, &c.

facturers believe no improvement can be made in them. The machine is designed for cutting locks in flour, lime, pork and fish barrel hoops, or in round hoops for use on any kind of package.

THE INDEPENDENT ELECTRIC COMPANY, Chicago, manufacturers of the Whitely Exerciser, call attention in their advertisement on another page to what they term their "Holiday Number" of this machine, an order for a sample of which they solicit from

the trade. The company refer to the attractiveness and selling qualities of this cheap and complete little home gymnasium complimentary letters concerning which they have received from a large number of persons.

### Oil Well Supply Co.'s Catalogue.

**O**IL WELL SUPPLY COMPANY, Pittsburgh, Pa., have issued a well arranged and fully illustrated catalogue and price-list of Gas and Oil Well Supplies, Brass Goods, Fittings, Tools and the almost innumerable materials included in Gas, Steam, Oil and Water supplies. The book is in convenient form, having 331 pages  $7 \times 5$  inches in size, the matter being alphabetically arranged after the manner of a dictionary, no index being necessary. The book describes the extensive line of the class of implements and supplies made at their ten separate factories. Anything necessary to drill and operate Artesian wells for Oil, Gas, Water or minerals can be found within the limits of the volume, up to outfits weighing 80 tons in shipping order, costing many thousands of dollars. In this connection it may be said that such drilling and pumping plants, together with experienced workmen, have been sent to Russia, Austria, Italy, Persia, India, Egypt, Africa, Canada, England, Hungary, Cuba, Peru, Brazil, Honduras, Mexico, Australia, Japan, China, New South Wales, Java, Sumatra, Roumania and other foreign countries, not to mention all parts of the United States. In this connection it is stated that while the drilling of Artesian wells is substantially the same everywhere, geological formations vary so in character that in order to form an intelligent opinion of what is wanted the company should be fully advised as to peculiarities of formation. In addition to their New York, Bradford and Oil City establishments the company state that they have more than 20 branch stores in different parts of the Pennsylvania oil regions.

### The Rochester Lamp Company's Catalogue.

**T**HE ROCHESTER LAMP COMPANY, 42 Park place and 37 Barclay street, New York, have just issued an illustrated catalogue and price-list of their new Rochester Lamp, including artistic designs in banquet, table, piano, library and hall Lamps, onyx and brass Tables, Parlor Heaters and Oil Stoves. This is known as Wholesale Catalogue 49, and is intended for the home trade, their export catalogue having been previously issued. This, it is announced, will shortly be followed by a supplement. In addition to the above goods are shown silk and linen Shades, Shade Frames and a variety of miscellaneous Lamp goods and trimmings in brass, bronze and tin. A large variety of new Rochester Lamps are illustrated and described, and other patterns are continually being added. Aside from the admirable lighting features of the new Lamp the die work in the metal goods is exceptionally fine, some 40 odd watch die makers having long being employed in this department at the extensive plant in Bridgeport, Conn., where the new Rochester is now made.



## Publisher's Department.

### How it Might be Done.

THE business manager, returning from lunch, had taken his seat with the feeling of relief natural at finding no visitors waiting to prevent his disposing of the accumulation on his desk. He was just settling down to work when the young lady whose duty it is to announce visitors informed him that a gentleman desired to see him. The visitor declined to give his name, but assured her that his business was important.

"Book agent?" said the manager.

"Think not. Has no package."

"Life insurance?"

"Don't know. Says you will be glad to see him when you know his business."

"Show him in" was said with the weary air of a man ready to bet gold dollars to carpet tacks that the axe to be ground would not turn out to be his.

The stranger was a small and bustling person, perfectly self satisfied and self possessed. He introduced himself as one whose time was valuable, as he knew was also that of the person he was addressing, to which the manager giving a polite nod of assent. He said:

"We will, then, be brief, and come at once to the point. When we make an arrangement, if you desire, I will give you my real name, but I am better known in the profession by my *nom de plume* of Pen Driver. I say profession, for to excel in it one must possess the qualifications of all professions. We are sometimes called promoters of publicity."

"Advertising agent?"

"By no means. My function is before and after, but particularly above that of the advertising agent. It has, it is true, to do with advertising, but on a plane immeasurably beyond the capacity of the best and most accomplished agent. It is mine to give an atmosphere of art and poetry to everything I touch."

"Ah! advertisement writer. The woods are full of them. One count has reached about 297½. One of them turns out to be a boy in an advertising agency. He is the half."

"I see you are not familiar with my work. As you say, that line is overdone and the public taste has become more fastidious, and little familiarities which seemed like slapping the reader on the back and saying: 'Hello, old chappie,' or 'old girl,' as the case might be, don't go so well now. Besides, advertisers don't want to pay for so much white paper as they used to. There is very little money in that sort of thing now."

"I do, however, claim to be the originator of the infantile or nursery style of advertising, and used to take much pride in it. About 10 or 15 years ago it was very effective. Could anything be better than this. I was swinging the advertising of the Dakota

Lamp Company—poor goods, less said about them the better. So I gave them—

Mary had a little Lamp,  
Its wick was white as snow  
And though Miss Mary often went,  
The Lamp would never go

out in the nightie time. Mary went.  
The Lamp did not go. Will you not go  
—now—to your desk and write for a  
circularlet, or better, send a dollar for  
a Lamp and save trouble.

"I claim circularlet as entirely original. If I were doing it now, I would also say dollaret."

"It is plain," said the manager, "that you have a remarkable talent, but I regret to say in a line for which I see no opening in *The Iron Age*, which circulates among a class of serious business men not likely to be taken with nursery rhymes or familiarities. They see too many travelers for that."

"My dear sir, I am business from start to finish. This year I call myself a trade persuader. Next year I shall be a trade producer—for two reasons: First, in my line all depends on pandering to the public desire for novelty. Second, we have persuaded all the trade now in existence, and to keep up the demand new trade must be produced."

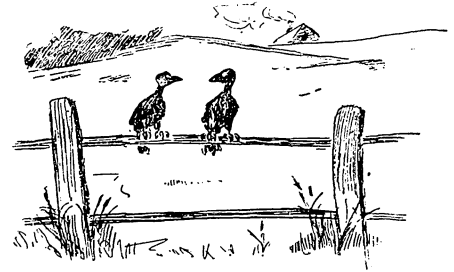
"But this is all preliminary. I have been engaged with one of the large department stores up town with such success that they will probably need but little from me next year, and in looking over the field for a new connection I naturally thought first of *The Iron Age*. I said, there is a publication which is old and well established, with an enormous circulation, but its advertising pages are filled with announcements that look as if they might have been written by the advertisers themselves and are illustrated by cuts that simply show the articles as they really are."

"But what," said the manager, "can be better than a business advertisement with a business cut in a business paper that goes to business men?"

"To a certain extent and for mere business purposes you are quite right, but every manual of the science of advertising will tell you that the first object to be gained is publicity, and if you confine the interest in your advertisements to grown up men you are ignoring the far greater number of ladies and young persons. What is there to interest them in your advertising pages? Twenty years ago, when *The Iron Age* was printed on about the largest sheet of paper used by any journal, and good paper, too, the ladies found it just the thing to cut dress patterns from. Don't you see what a publicity that was?"

"Now, I have called to day to explain to you a plan by which you can secure the attention of the family and office boys while strengthening your hold on your business men. Take for example the article of Crowbars. A picture of a Crowbar could not be made very attractive unless treated ideally, as in this sketch, which in your col-

umns would make an advertisement bound to secure results. Observe, a manufacturer prefers to sell more than



one crowbar, and so the second bar is added to the picture. Don't overlook the fact that the advertiser must take at least two or three times the space to insert this cut as would be needed for one of the article itself or for the words in good-sized type."

"Thought they were young turkeys."

"No, no. A very good representation of the election crow so many people are eating these days. I venture to say that, as a moderate, conservative estimate, one-half the subscribers to your paper would be urged by their families to confine their purchases to houses that showed not only their ability to make and sell goods, but also their desire to educate and amuse."

"All that is very well in advertising Lamps and gimcracks, but I don't think it would go with the up to date Hardwareman. Now, seriously, do you think an advertiser could be paid to put his name under a thing like that?"

"Certainly he would. I think I am right in saying there is not one of your advertisements devoted to Crowbars. If you will authorize me to solicit for you I guarantee to secure an order from the first maker to whom I show this sketch, and you see it will require a good sized space to hold the cut."

"Now, take another case—Taps and Dies. You advertise them. But how commonplace is the appearance of a cut that illustrates such simple articles. They should be treated in this way. In this sketch you will discover humor



and point, and something that irresistibly commands attention. Notice how I have caught the spirit of the trade. The man who taps is strong and robust and wears in his belt the insignia of his order, while he who dies is weak kneed and evidently one of the class Wall street calls lambs.



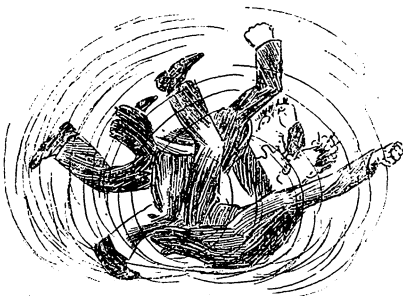
This cut shows what an advertisement should be—striking and prompt in its effect."

"I should think that cut would knock 'em out," said the manager, "though our people are tough and might manage to send a few dollars for a sample order before death."

"Your success, which is based, I should judge, more on a large circulation and the acknowledged character and influence of your journal than on the modern theories of advertising, has naturally made you conservative and not disposed to welcome innovations."

"That's where you're way off. There's not a man in the city more anxious for new ideas if they are better than the old. If not, I have no use for them."

"Well, let me go into heavier lines. You advertise a great many rolling mills with no cuts at all. This is wrong. You can't, it is true, make a picture of a rolling mill that would be of any earthly use in an advertisement, but you can do something like this."



What do you think of that, life and movement, eh? I should say so. The rolling mill that uses that cut will sell rolls every time. And this of Iron



Casting. Get on to the Chinaman. I am going to run the Chinaman strong next year. He'll make a success, like Palmer Cox's brownies. Bound to bring great results to any one bright enough to catch on to his pig tail."

"Safe enough, I guess. The Chinese won't be likely to declare war against us next year."

"I can do the same for any article you advertise. Here, see this coffee mill. I could get up something great."

For instance, put a sketchy picture of your coffee mill in lower right hand corner of, say, a half-page space; then in the upper left hand corner, in some peculiar arrangement of type, this beautiful quotation, slightly changed:

The mill will never grind again  
The coffee that has passed.

Or this, which I consider more to the point:

The coffee that goes often to the mill  
will be ground at last.

Then in the smallest type at the bottom say to send to the manufacturers for booklet, leaflet, circular or anything else you like that ends in *et*. People are bound to write for anything ending in *et*, and as the cut don't show much they have to write if they want to know anything about it.

"Don't you think you could afford to give more information in the advertisement and save some of this correspondence?" said the manager.

"No, sir! Advertisers want results. What are results? Why, inquiries, and if you give the reader points enough to decide if he wants an article, he won't write unless he means to buy it. Inquiries tickle the advertiser, even if he never makes a sale from them."

"Well, how about the cost of these artistic efforts of yours and how many can you turn out?"

"Oh, they can't be made cheaply. It takes about a day on an average to think up a scheme; then, as no one can make such designs in cold blood, it takes the best part of the evening and the expenditure of some money to get warmed up to the right point, and the drawing is finished about two or three o'clock in the morning. If one gets warmed up a little too much he can't do any work that night and not very much next day. Four or five a week is all that should be expected."

"Well, good day; we'll think it over," said the manager, who called his stenographer and dictated something like this to about 20 advertisers:

"DEAR SIR: I must call your attention again to the fact that the cut in your advertisement on page — is very much worn. You know that our edition is large and the wear on cuts necessarily severe. Please send us a new one. It seems a pity to save a twenty-five-cent electrotpe and spoil a hundred dollar advertisement."

BIGELOW & DOWSE COMPANY, 229 Franklin street, Boston, Mass., are headquarters for the Paragon Barn Door Hangers, having bought the entire stock when the Dunham Mfg. Company discontinued the manufacture of them. This purchase involved some four or five carloads of the Hangers, a stock which the Bigelow & Dowse Company advise us has not yet been exhausted, so that they are still in a position to furnish the goods to any in the trade who may desire them.

MARLIN FIREARMS COMPANY, New Haven, Conn., have adopted a novel advertising scheme in the shape of an

excellent quality of playing cards, with the cut of a Marlin Repeating Rifle on the back of each card, in connection with the name and address of the company. Each pack is contained in a paper box, upon which attention is called to Marlin Repeating Rifles and Marlin Safety.

IT WILL BE OBSERVED that Dame, Stoddard & Kendall, 374 Washington street, Boston, in their advertisement in this issue illustrate Forbes' new Skate, to the special features and merits of which they refer. They also carry in stock a full line of Winslow's and of Long Reach Skates.

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# Current Hardware Prices.

DECEMBER 5, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10 % @ 50 & 10 & 5 %, signifies that the goods in question are sold at prices ranging from 50 & 10 % to 50 & 10 & 5 %.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ &10%  
Excelsior,  $\frac{1}{2}$  doz. \$10.00.....50@10&22  
North's.....list net @ 10%  
Zimmerman's—See Fasteners, Blind.

**Ammunition**—See Caps, Cartridges, Shells, &c.

## Anvils—

### American—

Eagle Anvils,  $\frac{1}{2}$  m. 9c.....15@15&5%  
Horseshoe brand, Wrought.....9%@10%  
Barnes Mfg. Co.....50%

### Imported—

Armitage's Mouse Hole.....8%@9%  
S. & H. machine finished.....9%@10%  
Trenton.....9%@10%  
Peter Wright's.....9%@10%

## Anvil, Vise and Drill—

Allen Anvil and Vise, \$3.00.....40@10%  
Cheney Anvil and Vise.....25%  
Millers Falls Co., \$18.00.....20%  
Holt's.....40@40&10%

**Apple Parers**—See Parers, Apple, &c.

## Augers and Bits—

Common Augers and Bits.....70&10@75%  
Boring Machine Augers.....70&10@75%  
Car Bits, 12-in. twist.....50@50&10%  
Cincinnati Bell-Hangers' Bits.....40%  
Forstner Pat. Auger Bits.....25%  
Jennings' Pattern Car Bits.....40@40&10%  
Jennings' Pattern Auger Bits.....60@60&10%  
C. E. Jennings & Co., No. 10 extension  
lip.....40%  
C. E. Jennings & Co., No. 30.....40%  
C. E. Jennings & Co., Auger Bits,  $\frac{1}{2}$  set  
32 $\frac{1}{2}$  quarters, No. 5, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.....45%  
Russell Jennings' Augers and Bits.....25@10%  
Lewis' Patent Single Twist.....45%  
L'Hommedieu Car Bits.....15&10%  
Pugh's Black.....20%  
Pugh's Jennings Pattern.....30%  
Snell's Bits.....60&10@60&10&5%

## Bit Stock Drills—

Cleveland.....50&10&5%  
Morse Twist Drills.....60&5%  
New Process Twist Drill Co. Standard.....40@40&10%  
Syracuse, for metal.....40@40&10%  
Cincinnati, for wood.....50@50&10%  
Cincinnati, for metal.....50@50&10%  
Syracuse, for wood (wood list) 30&10@40%

## Expansive Bits—

Clark's small, 18; large, \$26.....40@40&5%  
Ives' No. 4,  $\frac{1}{2}$  doz. \$80.....40@40&10%  
Steer's No. 1, \$28; No. 2, 18.....40@40&5%  
Stearns' No. 2, \$48.....20%  
Swan's.....10@40&10%

## Gimlet Bits—

Bee.....25@25&10%  
Common..... $\frac{1}{2}$  gr. \$2.50@3.00  
Diamond,  $\frac{1}{2}$  doz. \$1.25.....40&10%  
Double Cut.....40&10%  
Hartwell's,  $\frac{1}{2}$  gr. \$10.00.....40&10%  
Douglass.....40&10@50%  
Ives'.....60&10@60&10&5%  
Shepardson's.....45&10@45&10&5%

## Hollow Augers—

Bonney's Adjustable..... $\frac{1}{2}$  doz. \$21.00  
Cincinnati Adjustable.....25&10%  
Cincinnati Standard.....25&10%  
Douglass.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ &10%  
French, Swift & Co. (Beecher).....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ &10%  
Ives'.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ &10%  
Ives' Expansive, each, \$4.50.....50&5%  
Stearns'.....20&10%  
Universal Expansive, each \$4.50.....20%  
Wood's,  $\frac{1}{2}$  doz. \$48.....25&10%

## Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%  
Snell's.....25@25&10%  
Snell's Ship Auger Pat'n Car Bits.....15&10@15&10&5%  
Watrous'.....25@25&10%

**Awl Hafts**—See Hafts, Awl.

## Awls—

Brad, Handled..... $\frac{1}{2}$  gr. \$2.50@3.00  
Brad, Shouldered..... $\frac{1}{2}$  gr. \$1.50@1.40  
Peg, Pat..... $\frac{1}{2}$  gr. 35@38¢  
Peg, Should..... $\frac{1}{2}$  gr. \$1.50@1.55  
Scratch, Handled..... $\frac{1}{2}$  gr. \$1.00@1.50  
Scratch, Socket..... $\frac{1}{2}$  doz. \$1.10@1.20

**Awl and Tool Sets**—See Sets, Awl and Tool.

## Axes—

First quality, best brands.....\$5.50@6.00  
First quality, other brands.....\$3.00@5.50  
Beveled, add 50¢  $\frac{1}{2}$  doz.

**Axle Grease**—See Grease, Axle.

## Axles—

No. 1 Common.....3¢  
No. 2 Common.....3 $\frac{1}{2}$ ¢  
Nos. 7 to 14.....70%  
Nos. 15 to 18.....47 $\frac{1}{2}$ ¢ 3% cash  
Nos. 19 to 22.....70&5%  
Concord, loose collar.....4 $\frac{1}{2}$ ¢  
Concord, solid collar.....4 $\frac{1}{2}$ ¢

**Bag Holders**—See Holders, Bag.

## Balances—

### Sash—

Caldwell, low list.....30%  
Pullman.....60%  
Sensible.....60%

## Spring—

Spring Balances.....40&10@50%  
No. 2000 20 30  
Chatillon,  $\frac{1}{2}$  doz. \$0.80 .95 1.75 net  
Chatillon Straight Balances.....40@40&10%  
Chatillon Circular Balances.....50&10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel..... $\frac{1}{2}$  m. 2 $\frac{1}{2}$ @3¢  
Iron, Steel Points..... $\frac{1}{2}$  m. 2 $\frac{1}{2}$ @2 $\frac{1}{2}$ ¢

## Basins, Wash—

Standard Fiberglass, No. 1, 10 $\frac{1}{2}$  in., \$1.80;  
12-inch, \$2.00; 13 $\frac{1}{2}$ -inch, \$2.50.

## Beams, Scale—

Scale Beams, List Jan. 12, '82.....50&10@50&10&5%  
Chattillon's No. 1.....40%  
Chattillon's No. 2.....50&10@50&10&5%  
Custers', doz. lots.....33 $\frac{1}{2}$ ¢

## Beaters—

### Egg—

Bryant's..... $\frac{1}{2}$  gr. \$14.00  
Double (H. & R. Mfg. Co.),  $\frac{1}{2}$  gr. No. 0, \$12.00; No. 1, \$15.00; No. 2, \$36.00.  
Dover..... $\frac{1}{2}$  doz. \$1.00;  $\frac{1}{2}$  gr. \$10.50  
Dover, Ex. Family size..... $\frac{1}{2}$  doz. \$3.50  
Dover (Standard Co.)..... $\frac{1}{2}$  doz. \$1.00  
Duplex (Standard Co.)..... $\frac{1}{2}$  doz. \$1.00  
Duplex Extra Heavy (Standard Co.)..... $\frac{1}{2}$  doz. \$3.50  
Easy (H. & R. Mfg. Co.)..... $\frac{1}{2}$  gr. 12.00  
Improved Acme (H. & R. Mfg. Co.)..... $\frac{1}{2}$  gr. \$4.50  
Silver & Co..... $\frac{1}{2}$  doz. \$4.50  
Spiral..... $\frac{1}{2}$  gr. \$4.25@4.50  
Triple (H. & R. Mfg. Co.)..... $\frac{1}{2}$  gr. \$16.50

## Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2

## Bells—

### Cow—

Common Wrought.....60&10%  
Kentucky Durham.....70&10%  
Kentucky, Sargent's list.....70&10%  
Kentucky "Star".....20&10%  
Texas Star.....50&10@60%  
Western, Sargent's list.....70&10%

### Door—

Crank, Brooks'.....50&10&2%  
Crank, Cone's.....10%  
Crank, Connel's.....20&10%  
Gong, Abbe's.....33 $\frac{1}{2}$ @10%  
Gong, Barton's.....40&10@50%  
Gong, Yankee.....45&10%  
Lever, R. & E. Mfg. Co.'s.....50&10&2%  
Lever, Sargent's.....60&10%  
Lever, Taylor's Bronzed or Plated.....net  
Lever, Taylor's Japped.....25&10%  
Pull, Brooks'.....60&10&2%

## Electric—

Bigelow & Dowse.....20@20&10%  
Wollensak's.....20@20&10%

## Hand—

Extra Heavy Brass.....70%  
Light Brass.....70&10@70&10&5%  
Silver Chime.....33 $\frac{1}{2}$ @10%  
White.....70%  
Globe (Cone's Patent).....25&10@35%

## Miscellaneous—

Call.....50%  
Furn Belts..... $\frac{1}{2}$  m. 2 $\frac{1}{2}$ ¢  
Steel Alloy Church and School Bells.....50%

## Bellows—

Blacksmiths'.....70@70&5%  
Hand Bellows.....50&10@50&10&5%  
Molders'.....50&10@50&10&5%

## Belting, Rubber—

Common Standard.....75&10@75&10&5%  
Extra.....60&10@60&10&5%  
Standard.....70&10@70%  
N. Y. B. & P. Co., Carbon.....60&10&5%  
N. Y. B. & P. Co., Double Diamond.....60%  
N. Y. B. & P. Co., 1846 Para.....40&10%

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15.....45%  
Detroit Perfected Tire Bender.....15@15&10%  
Green River Tire Benders and Upsetters.....20%  
Stoddard's Lightning Tire Upsetters.....15%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mal. Iron.....50&10@60&10%  
Moore's Novelty, Mal. Iron.....60%  
Sure Grip Steel Tackle Blocks.....25@25&10%  
See also Machines, Hoisting.

## Bolts—

Carriage, Machine &c.—Com., list June 10, '84.....80&20@80&25%

## Genuine Eagle, Norway, list Oct. '84.....80&5@80&10%

Eagle, Norway, list Oct. '84.....80&10@80&15%  
Phila. pattern, list Oct. 7, '84.....80%  
R. B. & W. old list.....70%  
Bolt Ends, list Jan. 1, '90.....80&20@80&25%  
Machine, list Jan. 1, '90.....80&25%

## Door and Shutter—

Cast Iron Barrel, Square, &c.....75&10@75&10&5%  
Cast Iron Chain (Sargent's list).....65&10@65&10&5%  
Cast Iron Shutter Bolts.....75&10&5%  
Ives' Patent Door.....60&10&5@60&10&10%  
Wrought Barrel.....75&10@80%  
Wrt B. K. Flush Common.....60&10@60&10&10%  
Wrt Shutter, Brass Knob.....59&10@60%  
Wrt Shutter, Sargent's list.....66%&70%  
Wrt Shutter, all Iron, Stanley's.....66%&70%  
Wrought Square.....75&10@80%  
Wrt Sunk Flush, Sargent's list.....60&10%  
Wrt Sunk Flush, Stanley's list.....60&60&10%

## Stove and Plow—

Plow.....60&10@60&10&10%  
Stove.....70@70&5%  
R. B. & W. Plow.....55%

## Tire—

Common, list Feb. 28, '83.....70&10%  
American Screw Company:  
Norway, Phila., list Oct. 16, '84.....75&10%  
Empire, Phila., list Oct. 16, '84.....80&10%  
Bay State, list Feb. 28, '83.....70&10%  
Franklin Moore Co.:  
Norway, Phila., list Oct. 16, '84.....75&10%  
Eagle, Phila., list Oct. 16, '84.....80&10%  
Eclipse, list Feb. 28, '83.....70&10%  
Port Chester Bolt & Nut Company:  
Empire, Phila., list Feb. 28, '83.....70&10%  
Keystone, Phila., list Oct. '84.....80&10%  
Norway, Phila., list Oct. '84.....75&10%  
R. B. & W., Phila., list Oct. 16, '84.....85%

## Borers, Tap—

Common and Ring.....20&10%  
Clark's.....33 $\frac{1}{2}$ @35%  
Enterprise Mfg. Co.....25%  
Ives' Tap Borers.....33 $\frac{1}{2}$ @35%

## Boring Machines—See Machines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Letter—

Tatum's.....40%

## Boxes, Wagon—

Per m.....2 $\frac{1}{2}$ ¢

## Boxes, Miter—

Spiker's Excelsior, 3-in., \$7.50; 4-in., \$8.50; 5-in., \$13.00; 6-in., \$15.00. 20%

## Braces—

NOTE.—Most Braces are sold at net prices.  
Barber's.....50&10%  
Armstrong's.....50&5%  
Common Ball, American.....\$1.00@1.10  
Barber's Patent.....50&10%  
Fray's Genuine Spofford's.....50&10&5%  
Fray's Nos. 70 to 120, \$1 to 123, 207 to 414.....50&10&5%  
Ives' New Haven Novelty.....70&70&5%  
New Haven Ratchet.....60&5@60&10%  
Barber Ratchet.....60&5@60&10%  
Barber's.....50&10%  
Spofford.....60&5@60&10%  
P. S. & W. Co., Peck's Patent.....60%  
Rose & Johnson.....50%

## Brackets—

Shelf, fancy:  
Sargent's list.....70@70&10%  
Other makes at a wide range of prices.  
Shelf, plain:  
Regular, list.....65@70%  
Sargent's list.....60&10@70&10%  
Bradley Shelf Brackets.....75%

## Bright Wire Goods—See Wire.

## Broilers—

Hens' Self,  $\frac{1}{2}$  Inch.....9 10 9x11  
Basting,  $\frac{1}{2}$  Per doz. \$4.50 5.50 6.50  
Morgan Quodless,  $\frac{1}{2}$  doz., \$12.....50%  
New Haven.....50%  
Wire Goods Co.....65&10%

## Buckets, Well and Fire—See Pails.

## Bull Rings—See Rings, Bull.

## Butchers' Cleavers—See Cleavers, Butchers'.

## Butts—

### Brass—

Cast Brass, Fast.....33 $\frac{1}{2}$ @10%  
Cast Brass, Loose Joint.....33 $\frac{1}{2}$ @10%  
Cast Brass, Tight Joint.....33 $\frac{1}{2}$ @10%  
Wrought Brass.....80&10@80&20%

### Cast Iron—

Fast Joint, Broad.....60&10@60&10&10%  
Fast Joint, Narrow.....60@60&10%  
Loose Joint.....  
Loose Joint, Jap., with Acorns.....75&10  
Loose Pin, Acorns.....@80%  
Loose Pin, Acorns, Japanned.....  
Loose Pin, Acorns, Japanned, Plated Pins.....  
Mayer's Hinges.....  
Parliament Butts.....

## Wrought Steel—

Fast Joint, Broad.....  
Fast Joint, Narrow.....  
Fast Joint, Lt. Narrow.....  
Inside Blind, Light.....  
Inside Blind, Regular.....  
Loose Joint, Broad.....  
Loose Pin.....  
Table Butts, Back Flaps &c.....

## Bronzed Wrought Butts.....50&10@50&10&5%

## Cages, Bird—

Hendryx, Brass:  
9000, 5000, 1100 series.....10%  
1200 series.....40%  
200, 300, 600 and 900 series.....40&10@50%  
Hendryx Bronze:  
700, 800 series.....40&10@50%  
Hendryx Enameled.....40&10@50%

## Calipers—See Compasses.

## Calks, Toe—

Burke's, One Prong, Blunt.....4 $\frac{1}{2}$ @5¢  
Burke's, One Prong, Sharp.....5 $\frac{1}{2}$ @6¢  
Burke's Two Prong, Blunt.....5 $\frac{1}{2}$ @6¢  
Burke's Two Prong, Sharp.....6 $\frac{1}{2}$ @7¢  
Gautier, One Prong, Blunt.....5 $\frac{1}{2}$ @6¢

## Can Openers—See Openers, Can.

## Cans, Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;  
10-gal., \$4.75 each.....40&10%

## Cans, Oil—

Galvanized Blue Band, 1-gal.,  $\frac{1}{2}$  doz. \$2.25

Galvanized Blue Band, 5-gal., Tip-Top,  $\frac{1}{2}$  doz. \$12.00

Galvanized Blue Band, 5-gal., Faucet,  $\frac{1}{2}$  doz. \$8.00

Glass Oil, Friend..... $\frac{1}{2}$  doz. \$2.75

## Caps—

### Percussion—

Eley's E. B.....52@56¢  
Hicks & Goldmark's and Union Metallic Cartridge Co.....1000  
E. B. Grand, Edge, Cent. Fire, 1-10's.....47@50¢  
E. B. Trimmed Edge, 1-10's.....47@50¢  
F. L. Waterproof, 1-10's.....35@37¢  
G. D.....27@30¢  
Musket, Waterproof, 1-10's.....50@53¢  
S. B. Genuine Imported.....45¢

### Primers—

Berdan Primers, \$1.00.....2%  
B. L. Caps (Sturtevant Shells) \$1.00.....2%  
All other primers, \$1.20.....2%

## Cards—

Watson's Cotton, Wool, Horse and File, list January 28, '91.....10%

## Carpet Stretchers—

See Stretchers, Carpet.

## Cartridges—

B. B. Caps, Con. Ball, Swgd.....\$1.85@1.90  
B. B. Caps, Round Ball.....\$1.60@1.65  
Blank Cartridges, except 22 and 32 cal. additional 10% to above discounts.  
Blank Cartridges, 22 cal. \$1.75.....2%  
Blank Cartridges, 32 cal., \$3.50.....2%  
Cent. Fire, Military and Sporting.....15&5&2%

Cent. Fire, Pistol and Rifle.....2&5&2%

**Chisels—**

Socket Framing and Firmer	
Mix.	
Ohio Tool Co.	75&10@80%
P. S. & W.	
Witherby.	
Buck Bros.	30%
Charles Buck.	30%
Douglas.	75&10@10%
Merrill.	60&10@80&10&5%
L. & I. J. White.	30&80&5%
Tanged and Miscellaneous.	
Buck Bros.	30%
Charles Buck.	30%
Butcher's.	\$4.75@5.00 to 2
Spear & Jackson's.	\$5 to 2
Tanged Firmers.	50&50&10%
L. & I. J. White, Tanged.	25&5%
Cold Chisels, fair quality.	\$14@16%

**Chucks—**

Beach Pat., each \$8.00.	20%
Danbury, each \$6.00.	30@30&5%
Graham Pat., each \$7.00.	20@20&5%
Morse's Adjustable, each \$7.00.	20@20&5%
Syracuse, Balz Pat.	25%
Skinner Patent Chucks:	
Combination Lathe Chucks.	40%
Drill Chucks.	25%
Independent Lathe Chucks.	40%
Planer Chucks.	40%
Universal Lathe Chucks.	40%
Union Mfg. Co.:	
Combination.	40%
Independent.	40%
Universal.	40%
Victor, \$5.50.	25%

**Churns—**

McDermid Star Barrel Churn, each	
6-gal., \$2.61, 10-gal., \$2.75; 15-gal.,	
\$3.00; 20-gal., \$3.25.	
Tiffin Union, each, 5-gal., \$3.25; 7-gal.,	
\$3.75; 10-gal., \$4.25.	

**Clamps—**

Adjustable Cincinnati.	25&10%
Adjustable, Hammers.	15@15&5%
Adjustable, Stearns.	30@30&10%
Barnes' Malleable Screw and Cabinet.	50%
Barnes' Machine's Clamps.	33%
Cabinet, Sargent's.	70&10%
Carpenters', Cincinnati.	25&10%
Carriage Makers', P. S. & W. Co.	40&10%
Carriage Makers', Sargent's.	75&75&5%
Eberhard Mfg. Co.	40&50&10%
Joiners' Clamps, Tatum's.	25&10%
R. I. Tool Co.'s Wrought Iron.	25%
Saw Clamps, see <i>Fishes Saw Files</i> .	
Stearns' Malleable, with Wrought Iron	
Screw.	75&75&5%
Stearns' Steel.	25%
Warner's.	40&10@40&10&5%

**Cleavers, Butchers—**

Beatty's.	40&50&10%
Bradley's.	25&30%
Foster Bros.	30%
New Haven Edge Tool Co.'s.	40%
Nichols Bros.	30%
P. S. & W.	33%&5@33%&10%
Schulte, Lohoff & Co.	40&40&5%
L. & I. J. White.	25%

**Clips—**

Baker Axle Clips.	25&10%
Norway Axle.	70&70&10%
Norway Spring Bar Clips.	60&10&10@70%
2d grade Norway Axle.	70&50&70&10%
Steel Felloe Clips.	70&40&10%
Superior Axle Clips.	70&70&10%
Wrought Iron Felloe Clips.	70&40&10%

**Cloth and Netting, Wire—**

See <i>Wire, etc.</i>	
Cockeyes	
Hardware list (Globe, Kerosene, Lever	
Bibbs, Racking, &c.).	60&10&2%

**Coffee Mills—**

See <i>Mills, Coffee.</i>	
Collars, Dog—	
Brass, Pope & Stevens' list.	40%
Chapman Mfg. Company, new list.	40%
Embossed, Gift, Pope & Stevens' list.	30&10%
Leather, Pope & Stevens' list.	40%
Medford Fancy Goods Co.	40&10&5%

**Combs, Curry—**

American Curry Comb Co.	33%&40%
Fitch's.	50&10@50&10&10%
Gibb's Magnetic.	20% doz.
Kohler's Humane.	20% doz.
Mohler's Magic Oscillating.	20% doz.
Rubber, 20 doz.	\$7.50.

**Compasses, Dividers, &c.—**

Compasses, Calipers, Dividers, 70&10&75%	
Bemis & Call Co.'s:	
Dividers.	65%
Calipers, Co's Patent Inside.	55%
Calipers, Double.	65%
Calipers, Inside or outside.	65%
Calipers, Wing.	60%
Compasses.	50&5%
Excelsior.	50%
Starrett's:	
Combination Dividers.	25%
Lock Calipers and Dividers.	25%
Spring Calipers and Dividers.	25&10%
Stevens & Co's.	25&10%

**Coolers Water—**

S. S. & Co.:	2-gal., \$3.40; 3-gal \$4.00;
4-gal., \$4.50; 6-gal., \$5.00 each.	60%

**Coopers' Tools—**

See <i>Tools, Coopers'.</i>	
Cord—	
Braided, Crown Drab and Fancy.	\$155.
Braided, Crown White.	\$150.
Cable Laid Italian Sash.	\$14@20%
Common.	\$12@13%
Common Russia Sash.	\$12@13%
Egyptian, India Hemp, Braided.	26%
India Cable Laid Sash.	\$11@12%
Massachusetts, White.	21@22%
Ossawa Mills	
Crown Solid Braided White.	\$122.
Crown, Drab and Fancy.	\$140.
Braided Giant, Drab and Fancy.	\$130.
Braided, Giant, White.	\$120.
Patent, good quality.	\$110@11%
Patent Russia Sash.	\$133@14%
Samson:	
Braided, Drab Cotton.	\$142.
Braided, Italian Hemp.	\$140.
Braided, Linen.	\$156.
Braided, White Cotton.	\$137.
Semper Idem, Braided, White.	28%
Silver Lake:	
A quality, Drab, 55¢.	25%
A quality, White, 60¢.	25%
B quality, Drab, 35¢.	40%
B quality, White, 30¢.	40%
Sylvan Spring, Extra Braided, Drab.	38%
Sylvan Spring, Extra Braided, White.	34%

**Tate's Solid Braided:**

Economy, Drab.	\$127¢
Economy, White.	\$122¢
Hercules, Drab.	\$122¢
Hercules, White.	\$125¢
White Cotton Braided, fair.	\$123@24%
Wire Picture—	
Braided or Twisted.	80&10@80&20%
Corkscrews—See Screws, Cork.	
Cork Knives and Cutters	
See <i>Knives, Cork.</i>	
Crackers, Nut—	
Acme:	
Japanese, 2 gr.	\$30.
Nickel Plated, 2 gr.	\$30.
Fancy Nickel Plated, 2 gr.	\$30.
Table (H. & B. Mfg. Co.).	40%
Turner & Seymour Mfg. Co.	50%
Cradles—	
Grain.	50&2@50&5&2%

**Crayons—**

White Crayons, 100 gross.	0@6%
Cases, 100 gr., \$3.75@4.25, at factory.	
D. M. Stewart Mfg. Co.	\$2.50.
Mal Workers', 2 gr.	\$2.50.
Railroad, 2 gr.	\$2.00.
Rolling Mill, 2 gr.	\$2.50.
Soapstone Pencils, 2 gr.	1.50.
See also <i>Chalk.</i>	

**Creamery Pails—See Pails, Creamery.****Crow Bars—See Bars, Crow.****Curry Combs—****See Combs, Curry.****Cutters—Meat—**

American	
1	2
Each.	\$5 \$7 \$10 \$25 \$50 \$60
Enterprise.	
Nos.	10 12 22 32 42
Each.	\$3 \$2.50 \$4 \$6 \$15
Dixon's, 2 doz.	40@40&5%
Nos.	1 2 3 4
\$14.00	\$17.00 \$19.00 \$30.00
Draw Cut, each:	
Nos.	5 2 6 8
\$50 \$75 \$80 \$225	20@25%
Hale's, 2 doz.	70@70&5%
Nos.	11 12 13
\$27.00	\$33.00 \$45.00
Home No. 1, 2 doz.	\$28.00.
Little Giant, 2 doz.	40&10@50%
Nos. 305 310 312 320 322	
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00	
Miles' Challenge, 2 doz.	45@45&10%
Nos.	2 3
\$22.00 \$30.00 \$40.00	
Triumph No. 505, 2 doz.	\$31.00.
Woodruff's, 2 doz.	40@40&5%
Nos.	100 150
\$15.00 \$18.00	
Chadborn's Smoked Beef Cutter, 2 doz.	\$80.00
Enterprise Beef Shavers.	
Tucker & Dorsey Mfg. Co.	40%
Kraut Cutters.	
Slaw Cutters, 1 Knife, 2 gr.	\$21.00
Slaw Cutters, 2 Knife, 2 gr.	\$30.00

**Tobacco**

Acme, 2 doz.	\$20.00.
All Iron.	20% doz.
Champion.	20% doz.
Nassau Lock Co's.	20% doz.
National, 2 doz.	\$21.00.
Sargent's, 2 doz.	\$24.00.
Appleton's, 2 doz.	\$16.00.
Bonney's, 2 doz.	\$8.50.
Cincinnati.	25&30%
Johnson's, Wm., 2 doz.	\$11.00.
Penny's, 2 doz.	\$11.14.
Smith's Pat., 2 doz.	\$12.00.
Tatum's.	25&10%

**Diggers, Post Hole, &c.—**

Eureka Diggers.	20% doz.
Fischer Post Hole Augers, 2 doz.	\$30.00.
Gem, Improved.	20@20&10%
Gibbs' Columbia.	20% doz.
Gibbs' Hustler.	20% doz.
Gibbs' Imperial.	20% doz.
Gibbs' National.	20% doz.
Gibbs' Post Hole Digger.	20% doz.
Kohler's Hercules.	20% doz.
Kohler's Invincible.	20% doz.
Kohler's Little Giant.	20% doz.
Kohler's Champion.	20% doz.
Kohler's Pioneer.	20% doz.
Ryan's.	20% doz.
Sampson, 2 doz.	\$34.00.
Universal.	25@25&10%
Shimer's Hollow Handle.	20% doz.
Vaughan's Post Hole Auger, 2 doz.	\$5.50@9.50

**Dividers—See Compass.****Dog Collars—See Collars, Dog.****Door Checks—****See Checks, Door.****Door Springs—****See Springs, Door.****Drawers, Money—**

Money Drawers.	20% doz.
Forford.	20% doz.
Waddell's Improved, No. 1.	20% doz.
Waddell's Improved, No. 2.	20% doz.
Waddell's Comb, Cutlery Case and Alarm Till.	\$12.50

**Drawing Knives—****See Knives, Drawing****Drills in Drill Stocks—**

Automatic, Best Tools.	\$1.75@1.85
Bench Drills, Boring.	\$1.75
Blacksmiths'.	each \$1.75
Blacksmiths' Self-feeding each.	\$7.50
Breast, Bartholomew's, No. 12, 2 doz.	\$16.00
Breast, Millers Falls, each \$3.00.	25%
Breast, P. S. & W.	70&70&10%
Breast, Wilson's.	30&5%
Chicopee Automatic Drill.	20&10%
Goodell Automatic Drills.	40&50&40&10%
Ratchet, Curtis & Curtis.	35%
Ratchet, Ingersoll's.	25%
Ratchet, Merrill's.	20@20&5%
Ratchet, Moore's Triple Action.	25@30%
Ratchet, Parker's.	20@20&10%
Ratchet, Weston's.	20@25%
Ratchet, Whitney's.	20&10%
Whitney's Hand Drill, Plain, \$11.00.	Adjustable, \$12.00.

**Twist Drills—**

Cleveland.	50&10%
Diamond, W. & B.	50&10%
Graham's Pat. Groove Shank.	50&10%
Morse.	50&10%

**New Process****Standard****Syracuse (Metal list)****Drill Bits or Bit Stock****Drills—See Augers and Bits.****Drill Chucks—See Chucks.****Dripping Pans—****See Pans, Dripping.****Drivers, Screw—**

Allard's Spiral.	50%
Brace Screw Drivers.	25&10%
Buck Bros.	30%
Buck Bros' Screw Driver Bits.	30%
Clark's Pat.	33%&40%
Cincinnati.	25&10%
Champion.	25&10%
Disston's.	50&50&10%
Douglas Mfg. Co.	20@20&10%
Electric Spiral.	50%
Elritch's Socket and Ratchet.	40&10%
Fray's Hol. H'dle Sets, No. 3.	\$12.00.
Gay & Parsons.	45%
Goodell's Automatic.	50&50&5%
Howard-Allard.	50%
Jones Reversible.	40%
Knapp & Cowles	70&10%
No. 2.	70&10%
No. 3.	60&10%
Nos. 4 and 00, Acme and Ideal.	60&10%
Kohl's Common Sense, 2 doz.	\$8.00.
Mayhew's Black Handle.	25&10%
Mayhew's Monarch.	45&10%
New York, Manhattan and Handy.	20%
P. S. & W.	70%
Sargent & Co's:	
No. 1, Forged Blade.	60&10&10%
Nos. 20, 40 and 60.	60&10&10%
Screw Driver Bits, Farr's.	2 gr. \$2.25
Screw Driver Bits.	2 doz. \$5.75
Stanley's R. & L. Co's	85&10%
No. 64, Varnished Handles.	70&10%
No. 86.	70&10%
Stearns'.	25&10&5%
Syracuse Screw Driver Bits.	30@30&5%
T. Williamson Wire Novelty Co.	50%

**Egg Beaters—See Beaters, Egg.****Egg Poachers—****See Poachers, Egg.****Electric Bell Sets—****See Bells, Electric****Emery—No. 4 to No. 54 to Flour, CF**

46 gr.	150 gr.
Kegs, 2 doz.	4 1/2¢ 5¢ 3¢
1/2 kegs, 2 doz.	4 1/2¢ 5¢ 3¢
10-b cans, 10	5¢ 5¢ 3¢
10-b cans, less	6¢ 6 1/2¢ 5 1/2¢
than 10—	10¢ 10¢ 8¢

**Enameled and Tinned****Ware—See Ware, Hollow.****Escutcheon Pins—****See Pins, Escutcheon.****Escutcheons—****Brass Thread.****Door Lock. Same dis. as Door Locks.****Wood.****Expanded Metal—****List No. 5.****Door Mats, Galvanized.****Lathing, Painted Sheets.****Netting, Painted Sheets.****Tree Guards, Paneled.****Window Guards, Paneled.****Extractions, Lemon Juice****See Squeezers, Lemon.****Fasteners, Blind—****Austin & Eddy, 2 gr. sets.****Mackrell's, 2 doz.****Security Gravity.****Van Sand's Old Pat., \$15 gr.****Van Sand's Screw Pat., \$15 gr.****Zimmerman's.****Faucets—****B. & L. B. Co.****West's Lock, Open and Shut Key.****Burnside's Red Cedar.****Burnside's Red Cedar, bbl. lots.****Cork Lined.****Fenn's.****Fenn's Cork Stops.**





Plate.  
Romer's Night Latches. 15%  
R. & E. Mfg. Co., list Mar. 20, 1889. 60¢@10¢70¢  
Sargent & Co., list July, 1894. 60¢@10¢70¢  
Warner's Burglar Proof. 75¢ doz. 50¢

**Elevator—**

Moore's. 33%  
Wrought Iron Padlocks—

Britan, Graham & Mathes, list Jan. '94. 75¢  
Mallory, Wheeler Co., list Jan. '94. 75¢  
Norwich Lock Mfg. Co., list June 10, '91. 50¢@25¢  
Russell & Erwin Mfg. Co., list June 10, '91. 50¢@25¢  
Sargent & Co., list January 1, '94. 75¢  
William Wilcox Mfg. Co., list January 1, '94. 75¢@20¢

Ames Sword Co., up to No. 103 inclu. 50¢  
Ames Sword Co., above No. 103. 50¢@10¢  
Barnes Mfg. Co., 40¢@40¢10¢  
Champion Padlock. 40¢  
A. E. Deltz. 40¢  
Eagle. 40¢  
Eureka, Eagle Lock Co. 40¢@25¢

E. T. Fraim's Keystone Scandinavian. 100 line. 90¢@50¢  
120 line. 90¢@50¢  
100 line. 65¢  
510 line. 70¢@10¢  
225, 610 and 200 lines. 70¢  
All other numbers. 50¢@50¢10¢

Horseshoe, 75¢ doz. \$9. 50¢@50¢10¢  
Hotchkiss. 30¢  
Nock's. 30¢  
Romer's Nos. 0 to 91. 30¢  
Romer's Scandinavian, &c., Nos. 100 to 505. 15¢  
Scandinavian. 90¢@50¢10¢

Slaymaker, Barry & Co. No. 1010 line. 90¢  
No. 41 line. 50¢  
No. 61 line. 60¢  
No. 21 line. 70¢  
No. 109 line. 90¢@40¢  
Star. 80¢  
Yale Lock Mfg. Co.'s. net prices

**Sash, &c—**

Atwell Mfg. Co. 25¢@33%  
Champion Safety, list January, 1893. 70¢@5¢  
Clark's No. 1, \$10; No. 2, \$8 3/4 gr. 33%  
Common Sense, Jap'd, Cop'd and Br'zd. 33%  
Common Sense, Nickel Plated. 33%  
Corbin's Daisy, list Feb. 15, 1890. 60¢  
Davis Bronze, Barnes Mfg. Co. 60¢  
Ferguson's. 33%  
Fish (Liesch's pat.), No. 100, gr. 8¢; No. 105, gr. \$10. 50¢  
Giant, list Jan. 1892. 70¢@10¢

Hammond's Window Springs, A. 50¢@10¢  
Hugunin's New Sash Locks. 25¢@25¢  
Hugunin's Sash Balances. 25¢@25¢  
Ives' Patent. 60¢@10¢50¢10¢10¢  
Kempshall's Gravity. 60¢  
Kempshall's Model. 60¢@60¢10¢  
Monarch's Patent. 60¢@50¢  
Payson's Patent. 60¢@50¢  
Reading. 60¢@10¢60¢50¢10¢10¢  
Security. 70¢  
Universal. 30¢  
Victor. 60¢@10¢25¢  
Walker's. 10¢  
Wolcott's. 60¢@10¢50¢

**Lumber, Tools—**

See Tools, Lumber.

**Lustro—**

Four-ounce bottles. 75¢ doz. \$1.75; 75¢ gross. \$17.00

**Machines.****Boring—**

Without Augers. Upright. Angular.  
Boss, Carpenters' \$3.50  
Boss, Ship Builders' 3.75  
Douglas. 5.50 \$8.75. 50¢  
Jennings. 5.50 6.75. 50¢@50¢50¢  
Miller's Falls. 7.50. 25¢  
Phillips' Patent with Auger. 7.00 7.50.  
Snell's, Rice's Pat. 5.50 6.75. 40¢@10¢10¢

**Fluting—**

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each. 35¢  
Combined Fluter and Sad Iron. 30¢  
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each. 35¢  
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25. 30¢  
Crown Jewel, 6 in., \$3.50 each. 35¢  
Domestic Fluter. 1.50 each, \$1.50  
Eagle, 3 1/2-inch Rolls, \$2.15. 35¢  
Eagle, 4 1/2-inch Rolls, \$2.85. 35¢  
Knox, 4 1/2-inch Rolls. \$3.25 each 35¢  
Knox, 6-inch Rolls. \$3.60 each 35¢

**Hoisting**

Moore's Anti-Friction Differential Pulley Block. 20¢  
Moore's Hand Hoist, with Lock Brake. 20¢  
Moore's Rope Differential Pulley Block. 60¢  
Marls & Beekley (Teal Patent). 30¢  
See also Blocks.

**Washing—**

Fair and Square. 75¢ doz. \$4.20  
Anthony Wayne, 75¢ doz. No. 1, \$42; No. 2, \$36; No. 3, \$42.00.  
Wayne American. 75¢ doz. \$36.00  
Weisell. 75¢ doz. \$36.00  
Western Star, 75¢ doz. No. 2, \$36; No. 3, \$39.

**Mallets—**

B. & L. Block Co., Hickory & L. V. 30¢@10¢40¢  
Fibre Head, Stearns. 33%  
Hickory. 20¢@10¢20¢10¢10¢  
Lignumvitae. 20¢@10¢20¢10¢10¢

**Mattocks—**

Regular list. 60¢@10¢10¢70¢

**Measures—**

Standard Fiberware, No. 1, peck 75¢ doz. \$3.50; 1/2 peck, \$3.00.

**Meat Cutters—**

See Cutters, Meat.

**Menders—**

Hudson's Hose Menders, in set, 75¢ doz. \$6.00  
Hudson's Hose Bands. 75¢ gr., \$1.25

**Milk Cans—See Cans, Milk.****Mills—**

Box and Side, list Jan. 1, 1888. 60¢@10¢  
Net prices are often made which are lower than above discount.  
American, Enterprise Mfg. Co., list Jan. 17, '93. 20¢  
National list, Jan. 1, '94. 30¢  
Sweet, Lane Bros. 30¢  
Wadell's New Box Mills, Ideal Brand, New list. 60¢@60¢10¢

**Mining Knives—**

See Knives, Mining.

**Molasses Cates—**

See Gates, Molasses.

**Money Drawers—**

See Drawers, Money.

**Muzzles—**

Safety. 75¢ doz. \$3.00, 25¢

**Nails—**

Cut and Wire. See Trade Report.  
Wire Nails, Papered.  
Association list, May 1, '92. 85¢@10¢90¢  
Hungarian, Finishing, Upholsterers, &c. See Tacks

**Horse—**

Nos. 6 7 8 9 10  
A. C. 25¢ 23¢ 22¢ 21¢ 21¢  
American. 9¢ 9¢ 9¢ 9¢ 9¢ net  
Anchor. 23¢ 21¢ 20¢ 19¢ 18¢ .35¢  
Ausable. 28¢ 26¢ 25¢ 24¢ 23¢  
Capewell. 19¢ 18¢ 17¢ 16¢ 15¢ 10¢5¢  
C. B. K. 25¢ 23¢ 22¢ 21¢ 20¢ .40¢  
Champion. 25¢ 23¢ 22¢ 21¢ 20¢  
Champlain. 28¢ 26¢ 25¢ 24¢ 23¢  
Clinton Fin. 19¢ 17¢ 16¢ 15¢ 14¢ 30¢5¢  
Empire Bronzed. 11¢@11¢  
Essex. 28¢ 26¢ 25¢ 24¢ 23¢  
Lyra. 9¢ 9¢ 9¢ 9¢ 9¢ net  
Maud S. 25¢ 23¢ 22¢ 21¢ 21¢  
Northwest'n. 25¢ 23¢ 22¢ 21¢ 20¢  
Putnam. 23¢ 21¢ 20¢ 19¢ 18¢ .25¢  
Snowden. 9¢ 9¢ 9¢ 9¢ 9¢ net  
Standard. 23¢ 21¢ 20¢ 19¢ 18¢ .35¢  
Vulcan. 23¢ 21¢ 20¢ 19¢ 18¢ .35¢  
Western. 23¢ 21¢ 20¢ 19¢ 18¢ .50¢

**Picture—**

Brass Head, Combination list. 50¢@10¢  
Brass Head, Sargent's list. 60¢@60¢10¢  
Porcelain Head, Combination list. 40¢@10¢  
Porcelain Head, Sargent's list. 50¢@10¢10¢  
Niles' Patent. 40¢

**Nail Pullers—See Pullers, Nail.****Nail Sets—See Sets, Nail.****Nippers, See Pliers and Nippers.****Nut Crackers—**

See Crackers, Nut.

**Nuts—List Dec. 18, 1889.**

Square Hex.  
Cold Punched. 35¢ 54¢ off list  
Hot Pressed. 64¢ off list  
In packages of 100 m add 1-10¢ m net;  
in packages less than 100 m, add 1/2¢ m net.

**Oakum—**

Best or Government. 75¢ m 6 60¢@4¢  
Navy. 75¢ m 5 54¢@4¢  
U. S. Navy. 75¢ m 5 54¢@5¢

**Oil Tanks—See Tanks, Oil.****Oilers—**

Brass and Copper. 50¢@10¢50¢10¢5¢  
Zinc and Tin. 70¢@70¢10¢  
Broughton's Brass. 50¢  
Broughton's Zinc. 60¢  
Malleable, Hammers' Improved, No. 1. \$3.60; No. 2, \$4.00; No. 3, \$4.40 10¢ doz. 10¢5¢  
Malleable, Hammers' Old Pattern, same list. 50¢  
Olmstead's Brass and Copper. 50¢  
Olmstead's Tin and Zinc. 60¢  
Prior's Pat. or "Paragon" Brass. 60¢  
Prior's Pat. or "Paragon" Zinc. 70¢  
Steel, Draper & Williams. 50¢  
Wilmot & Hobbs Mfg. Co., Steel Anti-Rust. 60¢

**Openers, Can—**

American. 75¢ gross \$1.75@2.00  
Champion, 75¢ doz. \$2.00. 50¢  
Domestic, 75¢ doz. \$2.00. 45¢  
Duplex. 75¢ doz. 25¢ 15¢@20¢  
Eureka. 75¢ doz. \$2.50, 10¢  
Excelsior, No. 1, \$2.50; No. 2 \$1.50. 40¢  
French, No. 4. 75¢ doz. 25¢ 55¢@60¢  
Iron Handle, No. 5. 75¢ gr. \$8.00, 45¢@60¢  
Lyman's. 75¢ doz. \$3.75, 20¢  
Messenger's Comet. 75¢ doz. \$3.00, 25¢  
Moore's. 75¢ doz. \$2.75, 30¢  
Sardine Scissors. 75¢ doz. \$2.75, 30¢  
Sprague, Iron or Wood Handles. 75¢ gr. \$4.75, 20¢  
Star. 75¢ doz. \$2.75

**Streeter's:**

Sensible, Japanned, 75¢ doz. 80¢  
Sensible, Nickel, 75¢ doz. 75¢  
Surprise, 75¢ doz. \$2.50, 10¢  
New Sprague, Metallic Handle, 75¢ doz. 60¢  
Universal, 75¢ doz. \$3.00. 55¢5¢  
World's Best, 75¢ gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00. 50¢@10¢

**Packing, Steam—**

Rubber—  
Standard, fair quality. 70¢@10¢75¢  
Inferior quality. 75¢@10¢80¢  
Extra. 60¢@50¢10¢10¢5¢  
Jenkins' Standard, 75¢ m 80¢. 25¢@25¢  
N. Y. B. & P. Co., Double Diamond. 60¢  
N. Y. B. & P. Co., Salamander. 45¢  
N. Y. B. & P. Co., Carbon. 70¢5¢  
Miscellaneous—  
American Packing. 9¢ @ 10¢ 75¢  
Cotton Packing. 14¢ @ 15¢ 75¢  
Italian Packing. 12¢ @ 13¢ 75¢  
Jute. 6¢ @ 7¢ 75¢  
Russia Packing. 13¢ @ 14¢ 75¢

**Pails—**

Creamery—  
S. S. & Co. 18-qt., \$7.00; 20-qt., \$7.25 5¢  
75¢ doz.

**Galvanized Pails—**

Heavy.  
10 Quart. \$2.00@2.25 \$2.25@2.50  
12 Quart. 2.25@2.50 2.50@2.75  
14 Quart. 2.50@2.75 2.75@3.00

**Galvanized Buckets—**

Fire. Well.  
10 Quart. \$2.50@2.75 \$2.75@3.25  
12 Quart. 2.75@3.00 3.00@3.50  
14 Quart. 3.00@3.25 3.00@3.50

**Indurated Fiber Ware—**

Fire Pails, deep. 75¢ doz. \$4.80  
Fire Pails, round bottom. 75¢ doz. 5.40  
Milk, 14 qt. 75¢ doz. 5.40  
Stable, 14 qt. 75¢ doz. 6.00  
Star Pails, 12 qt. 75¢ doz. 4.20

**Standard Fiber Ware—**

Buggy Pails. \$3.00  
Chamber Pails, 14 qt. 6.00 7.00  
Daisy. 75¢ doz. 3.75  
Fire Pails, No. 1, 12 qt. 75¢ doz. 3.75  
Fire Pails, No. 2, 14 qt. 75¢ doz. 4.25  
Horse Pails. 4.00  
Slop Jars (bal. trap). 7.50 8.50  
Sugar Pails. 4.75 5.25  
Water Pails, 12 qt. 75¢ doz. 3.00

**Pans—**

Dripping—  
Large sizes. 75¢ m 5¢  
Small sizes. 75¢ m 5¢  
Silver & Co. (Covered). 40¢

**Fry—**

Standard List:  
No. 0 1 2 3 4  
75¢ doz. \$3.75 \$4.25 \$4.75 \$5.25  
No. 5 6 7 8  
75¢ doz. \$6.00 \$7.00 \$8.00 \$9.00  
Polished, regular goods. 75¢@75¢10¢  
Acme Fry Pans. 60¢5¢

**Dust—**

Steel Edge, No. 1. 75¢ doz. \$1.75

**Roasting and Baking—**

Columbian, S. S. & Co. Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each. 60¢@10¢  
Paper and Cloth—  
and and Emery—  
List April 19, 1888. 50¢@10¢60¢  
Sibley's Emery and Crocus Cloth. 30¢

**Parers—**

Apple—  
Advance. 75¢ doz. \$4.50  
Baldwin. 75¢ doz. \$5.00  
Bonanza. 75¢ each \$5.00  
Daisy. 75¢ doz. \$3.50  
Dandy. 75¢ each \$7.50  
Eclipse. 75¢ doz. \$4.00  
Eureka, 1888. 75¢ each \$16.00  
Family Bay State. 75¢ doz. \$12.00  
Favorite. 75¢ doz. \$5.00  
Gold Medal. 75¢ doz. \$4.00  
Improved Bay State 75¢ doz. \$27.00@30.00  
Little Star. 75¢ doz. \$4.00  
Monarch. 75¢ doz. \$13.50  
New Lightning. 75¢ doz. \$5.50  
Oriole. 75¢ doz. \$4.00  
Penn. 75¢ doz. \$3.00  
Perfect. 75¢ doz. \$4.00  
Reading 72. 75¢ doz. \$4.00  
Reading 78. 75¢ doz. \$7.00  
Rocking Table. 75¢ doz. \$5.50  
Turn Table. 75¢ doz. \$4.50  
Victor. 75¢ doz. \$13.50  
Waverly. 75¢ doz. \$3.75  
White Mountain. 75¢ doz. \$4.00

**Potato—**

Antrim Combination. 75¢ doz. \$5.50  
Saratoga. 75¢ doz. \$5.50  
White Mountain. 75¢ doz. \$4.50

**Pencils, Soapstone—**

See Crayons.

**Pickers, Fruit—**

Prize Fruit Pickers. 50¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00. 60¢@10¢10¢70¢

**Picture Nails—**

See Nails, Picture.

**Pinking Irons—**

See Irons, Pinking.

**Pins—**

Bow—  
Humason, Beckley & Co.'s. 70¢@70¢10¢  
Peck, Stow & W. Co. 60¢@10¢60¢10¢10¢  
Sargent & Co.'s \$17 and \$18. 60¢@10¢60¢10¢10¢

**Escutcheon—**

Brass. 70¢  
Iron, list Nov. 11, '85. 75¢

**Pipe, Wrought Iron—**

1 1/2 and under, Plain. 57 1/2¢@10¢10¢10¢5¢  
1 1/2 and under Galv. 50¢@10¢10¢10¢5¢  
1 1/2 and over, Plain. 67 1/2¢@10¢10¢10¢10¢5¢  
1 1/2 and over, Galv. 57 1/2¢@10¢10¢10¢10¢5¢  
Boiler Tubes, list Oct. 24, '92. 65¢@10¢10¢10¢10¢5¢  
Casing, list Nov. 16, '92. 52 1/2¢@10¢10¢10¢10¢5¢  
Cold Drawn Seamless Steel Tubing. 50¢  
Inserted Joints Casing, list Nov. 16, '92. 47 1/2¢@10¢10¢10¢10¢5¢  
Steel Boiler Tubes. 27 1/2¢@10¢10¢10¢10¢5¢

**Planes and Plane Irons—**

Wood Planes—  
Molding. 50¢@10¢50¢10¢5¢  
Bench, First quality. 55¢@10¢55¢10¢5¢  
Bench, Second quality. 60¢@10¢60¢10¢70¢  
Bailey's (Stanley & L. Co.) 60¢@10¢

**Iron Planes—**

Bailey's (Stanley R. & L. Co.) 50¢@10¢  
Derby Plane Co. 70¢  
Chaplin's Iron Planes. 50¢@10¢60¢  
Gage Tool Co.'s Self-Setting. 35¢  
Miscellaneous Planes (Stanley R. & L. Co.) 25¢@10¢  
Sargent's. 60¢@10¢60¢10¢5¢  
Standard Tool Co. 60¢@10¢10¢10¢70¢  
Steers' Iron Planes. 50¢@10¢50¢10¢5¢

**Plane Irons—**

Auburn Thistle. 30¢@10¢30¢10¢10¢  
Buck Bros. 30¢  
Butcher's. \$5.00@5.25 to 2  
Ohio. 30¢@10¢30¢10¢10¢  
Sandusky. 30¢@10¢30¢10¢10¢  
Stanley R. & L. Co. 50¢10¢  
L. & J. White. 25¢

**Plates—**

Fellow. 75¢ m 60¢@60¢

**Pliers and Nippers—**

Button's Patent. 60¢  
Carew's Pat. Wire Cutters. 20¢  
Cronk's Stub's Pat. Pliers. 50¢  
Cronk's Button Pattern. 70¢  
Eureka Pliers and Nippers. 40¢  
Gas Pliers. 60¢  
Gas Pliers, Custar's Nickel Plated. 80¢@5¢  
Hall's Nippers, No. 2, 5 in., \$13.50; No. 7 in., \$21.00 75¢ doz. 40¢10¢  
Hall's Pliers. 70¢  
Humason & Beckley Mfg. Co. 50¢@50¢10¢  
Lindsay's Giant, No. 55, 5 in., 75¢ doz. \$10.50. 33%  
Morrell's Parallel, 75¢ doz. \$12.00. 30¢5¢  
P. S. & W. Cast Steel. 50¢@50¢10¢  
P. S. & W. Tinner's' Cutting Nippers, add 6¢. 10¢  
Russell's Parallel. 25¢  
Waterbury Nip's, 5 in., 75¢ doz. \$7.50, 33%  
Plumbs and Levels—  
Regular List. 75¢@10¢80¢  
Cook's. 40¢@10¢  
Davis Inclinoimeters. 10¢@10¢  
Davis Iron Levels. 50¢@50¢10¢  
Disston's. 50¢@50¢10¢  
Pocket Levels. 70¢@10¢70¢10¢10¢  
Stanley's Duplex. 20¢10¢  
Stanley's Handy. 20¢10¢

**Poachers, Egg—**

Buffalo Steam Egg Poachers, 75¢ doz. No. 1, \$6.00; No. 2, \$9.00. 33%  
Silver & Co., 8-Ring, 75¢ doz. \$3.60; 3-Ring. \$1.80

**Pokes Animal—**

Bishop's American. 75¢ doz. \$2.50  
Bishop's I. X. L. 75¢ doz. \$2.50  
Bishop's Steel Monarch. 75¢ doz. \$2.50  
Bishop's Pioneer. 75¢ doz. \$2.50  
Bolding. 75¢ doz. \$5.00  
Buckeye Single Stale. 75¢ doz. \$2.50  
Columbia, Double Stale. 75¢ doz. \$5.00  
Eagle, Double Stale. 75¢ doz. \$5.00  
Eagle, Single Stale. 75¢ doz. \$3.25  
Metallic Horse Poke. 75¢ doz. \$5.00

**Police Goods—**

Daley's Improved Handcuffs, 2 Hands, Polished, 3 hands. Polished, 75¢ doz. \$72.00; Nickel, \$84.00. 25¢  
J. P. Lovell's Police Goods. 25¢  
Newhall Ship Chandlery Co. Handcuffs, \$15.00 75¢ doz. 25¢  
Tower's. 25¢

**Polish—**

Metal—  
Gaston's Silver Compound. 33%  
Presoline Paste. 33%  
Tantite Mills:  
Paste, 1/2 m tins. 75¢ gr. \$14.40  
Paste, 1 m tins. 75¢ gr. \$30.00  
Liquid, 1/2 pint. 75¢ gr. \$38.00  
Powder, 1 m. 75¢ gr. \$38.00  
Wynn's White Silk, 75¢ pnt. cans 75¢ doz. \$1.57

**Stove—**

Black Eagle Benzine Paste, 5 and 10 m cans. 12¢  
Black Flag, 5 and 10 m pails. 75¢ m 10¢25¢  
Black Jack Water Paste, 5 and 10 m cans. 12¢  
Bonnell's Liquid Stove Polish. 75¢ gr. \$9.00  
Bonnell's Paste Stove Polish. 75¢ gr. \$9.00  
Boynton's Noon Day. 75¢ gr. \$13.00  
Crown Paste. 75¢ gr. \$9.00  
Crown Paste in 5 and 10 m pails. 12¢  
Diamond O. K. Enamel. 75¢ gr. \$19.00  
Diamond Rock Nickel Cleaner. 75¢ gr. \$10.20  
Joseph Dixon's. 75¢ gr. \$8.00. 10¢  
Dixon's Plumbago. 75¢ m 8¢  
Fireside. 75¢ gr. \$2.50  
Gem. 75¢ gr. \$4.5



## Pruning Hooks and Shears—See Shears.

**Pullers—Nail—**  
Eclipse,  $\frac{1}{2}$  doz. \$24.00.....40%  
Economy..... $\frac{1}{2}$  doz. \$5.50@6.00  
Elrich,  $\frac{1}{2}$  doz. \$10.00.....  
Grant, No. 1,  $\frac{1}{2}$  doz. \$18.00; No. 1 $\frac{1}{2}$  \$16.50;  
No. 2 \$15.00.....  
Pelican,  $\frac{1}{2}$  doz. \$9.00.....25%  
Scranton,  $\frac{1}{2}$  doz. \$18.00, 33 $\frac{1}{2}$ ¢@33 $\frac{1}{2}$ ¢@10%

## Pulleys—

Brass Screw.....70%  
Hay Fork, "Anti-Friction," 5-in solid,  
\$5.70.....50%  
Hay Fork, "F" Common and Patent  
Bush.....20%  
Hay Fork, Moore's Anti-Friction, 5-in  
Wheel,  $\frac{1}{2}$  doz. \$12.00.....40%  
Hay Fork, Reed's Self-Lubricating.....60%  
Hay Fork, Solid Eye, \$4.00; Swivel,  
\$4.50.....50%  
Hay Fork, Stearns' No. 35 & 45.....50%  
Hay Fork, Stearns' Nos. 15, 25, 50, 60.....60%  
Hay Fork, Tarbox, Pat. Iron.....20%  
Hot House, Awning, &c.....60%  
Japanned Clothes Line.....60%  
Japanned Screw.....70%  
Japanned Side.....70%  
Moore's Ceiling or End, Anti-Friction.....40%  
Moore's Dumb Water, Anti-Friction.....50%  
Moore's Electric Light.....50%  
Moore's Side, Anti-Friction.....50%  
Sash (Auger Mortise). On bbl. lots ex. 5%  
Common Sense.....80%  
Empire.....60%  
Acme.....60%  
Ideal, Nos. 2, 4, 10 & 15.....60% less 1¢  
Star.....doz. net.  
Ideal, or IXL No. 60..... $\frac{1}{2}$  doz. 22¢ net.  
Shade Rack.....45%  
Shepard's Niagara, No. 25,  $\frac{1}{2}$  doz. 23¢ net.  
Tackle Blocks—See Blocks.

## Pumps—

Cistern, Best Makers.....60%  
Pitcher Spout, Best Makers.....70%  
Pitcher Spout, Cheaper G'ds.....75%  
Myers' Pump, low list.....50%  
Detroit Valve & Washer Co.'s Pump  
Leathers..... $\frac{1}{2}$  gr. \$6.00

## Punches—

Avery's Revolving.....40%  
Avery's Sawset and Punch—See Sawsets.  
Bemis & Call Co.'s Cast Steel Drive.....50%  
Bemis & Call Co.'s Cast Steel Drive.....50%  
Bemis & Call Co.'s Spring.....50%  
Bemis & Call Co.'s Springfield Socket.....60%  
Niagara Hollow Punches.....20%  
Niagara Solid Punches.....55%  
Rice Hand Punches.....15%  
Saddlers' or Drive, good..... $\frac{1}{2}$  doz. 60¢  
Spring, good quality..... $\frac{1}{2}$  doz. \$2.50  
Spring, Leach's Pat.....15%  
Solid Tinnings, P., S. & W. Co.,  $\frac{1}{2}$  doz.....55%  
\$1.44.....  
Hollow Tinnings, P., S. & W. Co.....20%  
22¢

## Rail—

Barn Door, Light.....In.  $\frac{3}{4}$  3 $\frac{1}{2}$   
100 feet.....\$1.75 2.10 2.75  
B. D., for N. E. Hangers:  
Small. Med. Large.  
100 feet.....\$2.00 2.50 3.00 net  
Cronk's Double Braced Steel Rail,  $\frac{1}{2}$   
foot.....34¢  
Lundy Parlor Door, Planed Edge,  $\frac{1}{2}$  ft. 7 $\frac{1}{2}$   
Moody Steel Rail,  $\frac{1}{2}$  ft. 5 $\frac{1}{2}$ .....45%  
Moore's Steel Rail.....35%  
Sliding Door, Bronzed Wrt Iron,  $\frac{1}{2}$  ft. 6 $\frac{1}{2}$   
Sliding Door, Iron, Painted..... $\frac{1}{2}$  ft. 2¢  
Sliding Door, Wrt Brass,  $\frac{1}{2}$  ft. 35¢, 40¢  
Terry's Steel Rail.....  
Victor Track Rail,  $\frac{1}{2}$  ft. 7 $\frac{1}{2}$ .....50%  
10%

## Rakes—

Cast Steel, Association G'ds.....70%  
Cast Steel, outside G'ds.....70%  
Malleable, good.....70%  
Malleable, low grade.....75%  
Fort Madison Prize Bow Brace ar.  
Peerless.....65%  
Fort Madison Steel Tooth Lawn Rake,  
\$6.00.....35%  
Gibbs..... $\frac{1}{2}$  doz. \$4.90  
Gibbs' Acme Lawn Rake..... $\frac{1}{2}$  doz. \$4.75  
Gibbs' Crown Lawn Rake..... $\frac{1}{2}$  doz. \$3.75  
Gibbs' Crown Lawn Rake, No. 2..... $\frac{1}{2}$  doz. \$4.00  
Gibbs' Favorite Lawn Rake..... $\frac{1}{2}$  doz. \$3.90  
Gibbs' Hustler No. 0..... $\frac{1}{2}$  doz. \$4.25  
Gibbs' Hustler No. 1..... $\frac{1}{2}$  doz. \$4.40  
Onella Lawn Rake..... $\frac{1}{2}$  doz. \$6.00

## Razors—

Campbell Cutlery Co.....50%  
Electric Cutlery Co..... $\frac{1}{2}$  doz. \$12.00  
Galvanic..... $\frac{1}{2}$  doz. \$12.00  
Jordan's AAAI, new list.....Net prices  
Jordan's Old Faithful, new list.....Net prices  
J. R. Torrey Razor Co.....Net prices  
Wostenholm and Butcher, \$10 to 2.....10%

## Razor Straps—

See Straps, Razor.

## Reels—

**Clothes Line—**  
Stearns'.....33 $\frac{1}{2}$ ¢@10%  
**Fishing**  
Hendryx Aluminum, German Silver,  
Gold, Bronze, Silver, Rubber, Popul  
and Salmon, Single Action, Multipl  
ing and Quadruple, sizes.....25%  
Hendryx Single Action Series, 102P  
and PN, 202P and PN, 102 PR and  
PRN, 202 PR and PRN, 304 P and  
PN, 00304P and PN, 502 and 502N,  
802 and 802N, 0204N, Competitor.....50%  
Hendryx Multiplying and Quadruple  
Series, 3004N and PN, 4N and PN,  
2904N, 2904P and PN, 002904PN, 0924  
and 0924N, 5009N and PN.....40%  
10%

## Registers—

Moore's Bronze Finishes.....75%  
Moore's Electroplated.....80%  
Moore's Japanned.....80%  
Moore's Solid Bronze.....80%  
Moore's Stove Pipe.....33 $\frac{1}{2}$ ¢

## Cash Registers—

Morford.....each, \$35.00  
**Rings and Ringers—**  
**Bull Rings—**  
Humason, Beckley & Co.'s.....80%  
Peck, Stow & W. Co.'s.....60%  
Sargent's.....80%

**Hog Rings and Ringers—**  
NOTE.—The market on Hog Rings and  
Ringers is in a demoralized condition  
and prices are low and irregular. We  
therefore withdraw quotations for the  
present.

## Rivets and Burrs—

Copper.....60%  
60%  
10%

Iron Norway, list Nov. 1, '94.....85%  
Second quality.....75%

## Rivet Sets—See Sets.

## Roasting and Baking Pans—See Pans, Roasting and Baking.

## Rods—

Stair, Black Walnut..... $\frac{1}{2}$  doz. 40¢  
Stair, Brass.....25%  
50%

## Rollers—

Acme Moore's Anti-Friction.....50%  
Barn Door, Sargent's list.....60%  
Moore's Barn Door Stay.....50%  
Union Barn Door Roller.....70%  
Thompson's Mfg. Co.'s Lawn Rollers.....30%

## Rope—The following prices are f.o.b.

New York or factory, and are shaded  
b.  $\frac{1}{2}$ ¢ on large lots; terms, 1 $\frac{1}{2}$ ¢ for  
cash.  
Manila, 7-16 in. diam. and  
larger..... $\frac{1}{2}$  b 73¢@8 $\frac{1}{2}$ ¢  
Manila..... $\frac{1}{2}$  b 84¢@8 $\frac{1}{2}$ ¢  
Manila, 7-16 in. and 5-16 in..... $\frac{1}{2}$  b 94¢@9 $\frac{1}{2}$ ¢  
Manila, Tarred Rope, Med'm..... $\frac{1}{2}$  b 73¢@8 $\frac{1}{2}$ ¢  
Manila, Hay Rope, Med'm..... $\frac{1}{2}$  b 73¢@8 $\frac{1}{2}$ ¢  
Sisal, 7-16 in. and larger..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
Sisal..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
Sisal, Hay Rope..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
Sisal, Tarred Rope..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
Sisal, Medium Lath Yarn..... $\frac{1}{2}$  b 4¢@4 $\frac{1}{2}$ ¢  
New Zealand, 7-16 in. and  
larger..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
New Zealand..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
New Zealand, 7-16 in. and 5-16 in..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
New Zealand Hay Rope..... $\frac{1}{2}$  b 5¢@5 $\frac{1}{2}$ ¢  
New Zealand Tarred Rope..... $\frac{1}{2}$  b 4¢@4 $\frac{1}{2}$ ¢  
Cotton Rope..... $\frac{1}{2}$  b 12¢@13¢  
Jute Rope..... $\frac{1}{2}$  b 5¢@6¢

## Wire Rope—

List Sept. 1, '94. All kinds. 20¢@2 $\frac{1}{2}$ ¢ cash

## Rules—

Boxwood.....80%  
Ivory.....50%  
Starrett's Steel Rules and Straight  
Edges.....25%  
10%

## Sad Irons—

See Irons, Sad.

## Sand and Emery Paper and Cloth—

See Paper and Cloth.

## Sash Cords—See Cord, Sash.

## Sash Locks—See Locks, Sash.

## Sash Weights—

See Weights, Sash.

## Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

## Saws—

NOTE.—Extra 5¢@10% often given.

Atkins' Circular.....50%  
Atkins' Band.....50%  
Atkins' Cross Cut, new list.....50%  
Atkins' Mulay, Mill and Drag.....50%  
Atkins' One-Man Saw.....40%  
Atkins' Wood Saws.....40%  
Atkins' Hand, Compass, &c.....40%  
Disston's Circular.....45%  
Disston's Cross Cut, list Jan. 1, '93.....45%  
Disston's Hand.....25%  
C. E. Jennings & Co.'s.....25%  
Peace Circular and Mill.....45%  
Peace Cross Cuts, list Jan. 1, '93.....45%  
Peace Hand, Panel and Rip.....25%  
Richardson's Circular and Mill.....45%  
Richardson's X Cuts, list Jan. 1, '93.....45%  
Richardson's Hand.....45%  
Simonds' Circular Saws.....45%  
Simonds' Crescent Ground Cross Cut  
Saws.....30%  
Simonds' One-Man Cross Cuts.....40%  
Simonds' Gang Mill, Mulay and Drag  
Saws.....45%  
Wheeler, Manning & Clemson Mfg. Co.  
Cross Cuts, list Jan. 1, '93.....45%  
Hand, Panel and Rip.....30%  
Woodrough & McFarlin.....45%  
Cross Cuts, list Jan. 1, '93.....45%  
Hand, Panel and Rip.....25%  
10%

## Hack Saws—

Eureka and Crescent.....25%  
Griffin's complete.....40%  
Griffin's Hack Saw Blades.....40%  
Star Hack Saws and Blades.....25%

## Scroll—

Barnes' No. 1, 88; No. 6, \$10; No. 7, \$15.25.  
Barnes Scroll Saw Blades.....35%  
Lester, complete, \$10.00.....25%  
Rogers, complete, \$4.00.....25%

## Saw Frames—

See Frames, Saw.

## Saw Sets—See Sets, Saw.

## Saw Tools—See Tools, Saw.

## Scale Beams—

See Beams, Scale.

## Scales—

Chattillon's Eureka.....25%  
Chattillon's Favorite.....40%  
Chattillon's Grocers' Trip Scales.....50%  
Family Turnbills.....30%  
Hatch, Counter, No. 171, good quality,  
 $\frac{1}{2}$  doz. \$17.00@18.00  
Hatch, Tea, No. 101..... $\frac{1}{2}$  doz. \$8.00@8.50  
Riehle Bros.' Platform.....40%  
Union Platform, Plain.....\$2.00@2.10  
Union Platform, Striped.....\$2.15@2.25  
Standard.....50%

## Scissors, Fluting—

## Scrapers—

Adjustable Box Scraper (S. R. & L. Co.)  
\$8.00.....40%  
Box, 1 Handle..... $\frac{1}{2}$  doz. \$2.00  
Box, 2 Handle..... $\frac{1}{2}$  doz. \$3.00@4.00  
Foot.....40%  
Ship, Common..... $\frac{1}{2}$  doz. \$3.50  
Ship, R. I. Tool Co.....10%  
Tatum's Box.....25%  
10%

## Screen Window and Door Frames—See Frames.

## Screw Drivers—

See Drivers, Screw.

## Screws—

Bench, Iron.....55%  
Bench, Wood, Beech..... $\frac{1}{2}$  doz. \$2.25  
Bench, Wood, Hickory.....20%  
Bench, Wood.....25%  
Hand, Grand Rapids.....35%

## Coach, Lag and Hand Rail—

Lag, Blunt Point, list Jan. 1, '90.....85%  
Coach and Lag, Gimlet Point, list Jan. 1,  
'90.....80%  
Hand Rail, Am. Screw Co.....80%  
Hand Rail, H. & B. Mfg. Co.....75%  
Hand Rail, Sargent's.....70%

## Jack Screws—

Millers Falls.....50%  
Millers Falls, Roller.....50%  
P. S. & W. Co.....35%  
Sargent's.....70%  
Stearns'.....40%  
Tatum's.....25%

## Cork

Detroit Cork Screw Co.....33 $\frac{1}{2}$ ¢  
Humason & Beckley Mfg. Co.....40%  
Williamson's.....33 $\frac{1}{2}$ ¢  
Williamson's Serged Worm Apple-  
wood Handle,  $\frac{1}{2}$  doz. \$5.00; Rose-  
wood, \$5.50.....40%

## Machine—

List August 1, '94.

## Wood—

List January 1, '91.  
Flat Head, Iron.....85%  
Round Head, Iron.....45%  
Flat Head, Brass.....85%  
Round Head, Brass.....75%  
Flat Head, Bronze.....80%  
Round Head, Bronze.....75%  
Rogers' Drive Screws.....87 $\frac{1}{2}$ ¢  
Extra 10% often given.

## Scroll Saws—See Saws, Scroll.

## Scythes—

Clark.....40%  
Grass.....40%

## Scythe Snaths—

See Snaths, Scythe.

## Sets—Awl and Tool—

Alken's Set of Awls and Tools.....60%  
Common Brad Sets:  
No. 42, \$10.50; No. 43, \$12.50, 70¢@10¢  
Fray's Adj. Tool H'dls., No. 1, 12, 2,  
\$18; 3, \$12; 4, \$9; 5, \$7.....50%  
Henry Combination Flat..... $\frac{1}{2}$  doz. \$6.00  
Miller's Set of Adj. Tool H'dls., No. 1,  
\$12; No. 4, \$12; No. 5, \$18.....25%

## Stanley's Excelsior—

No. 1, \$7.50; No. 2, \$4.00; No. 3,  
\$5.50.....30%  
10%

## Nail—

Round..... $\frac{1}{2}$  gr. \$3.25  
Square..... $\frac{1}{2}$  gr. \$4.00@4.25  
Black Brads..... $\frac{1}{2}$  doz. \$7.00  
Cannon's Diamond Point,  $\frac{1}{2}$  gr. \$12.....20%

## Rivet—

Regular list.....70%

## Saw—

Atkin's Criterion..... $\frac{1}{2}$  doz. No. 1, \$6.00  
Alken's Genuine, \$13.00.....50%  
Alken's Imitation..... $\frac{1}{2}$  doz. \$3.00@3.25  
Alken's Royal..... $\frac{1}{2}$  doz. \$7.00  
Avery's Saw Set and Punch.....50%  
Bemis & Call Co.'s Cross Cut.....30%  
Bemis & Call Co.'s Plate.....20%  
Bemis & Call Spring Hammer.....30%  
Common Lever,  $\frac{1}{2}$  doz. \$2.00.....45%  
Crescent..... $\frac{1}{2}$  doz. \$3.00  
Crosby's Saw Set, No. 1, \$15.00.....40%  
\$24.00 (Keller), No. 1, \$15.00.....40%  
Disston's Star.....25%  
Hammer, Bemis & Call Co.'s new Pat. 45%  
Hammer, Hotchkiss, \$5.50.....10%  
Hart's Pat. Lever.....20%  
Kohler's Giant Royal..... $\frac{1}{2}$  doz. \$12.00  
Miller's Royal..... $\frac{1}{2}$  doz. \$7.00  
Leach's, No. 0, \$8; No. 1, \$15.....45%  
Leopold.....40%  
Lloyd's Acme,  $\frac{1}{2}$  doz. \$15.....40%  
Morrell's No. 1, \$15.00.....40%  
Nos. 3, 4, Cross Cut, \$23.00.....40%  
No. 5, Mill, \$31.00.....40%  
No. 6, \$20.00.....40%  
No. 11, \$16.00.....40%  
Nash's.....20%  
Stillman's Genuine,  $\frac{1}{2}$  doz. \$5.00@7.75  
40%

## Stillman's Pattern, Hand, $\frac{1}{2}$ doz. \$3.25.

Cross Cut, \$6.50.....55%  
Tator Positive,  $\frac{1}{2}$  doz. \$15.00.....60%

## Sharpeners, Knife—

Parkin's:  
Rosewood Handles,  $\frac{1}{2}$  doz. \$6.00.....50%  
Rosewood or Cocobola,  $\frac{1}{2}$  doz. \$9.....50%  
Tantle Mills,  $\frac{1}{2}$  gr. \$14.40.....25%  
33 $\frac{1}{2}$ ¢

## Shaves, Spoke—

Iron.....45%  
Wood.....30%  
Bailey's (Stanley R. & L. Co.).....50%  
Chisel.....25%  
Goodell's,  $\frac{1}{2}$  doz. \$9.00.....25%  
Stearns'.....40%  
Tatum's.....25%

## Shears—

Acme Co.'s Shears.....40%  
American Cast Iron.....75%  
Barnard's Lamp Trimmers,  $\frac{1}{2}$  doz. \$3.75  
Barnard, Solid Steel Blade, Jap'd.....75%  
Barnard, Solid Steel Blade, Nickleled, 65%  
Cast Steel Trimmers:  
First quality.....80%  
Second quality.....80%  
Campbell Cutlery Co., Jap'd.....75%  
Nickel Plated.....65%  
Claus brand, Japanned.....70%  
Claus brand, Nickleled, same list.....60%  
Clipper.....10%  
Davenport Cutlery Co.....60%  
Diamond Cast Shears.....10%  
Eclipse Cast Shears.....40%  
Galvanic,  $\frac{1}{2}$  to 9 in.,  $\frac{1}{2}$  doz. \$1.00 @ 1 $\frac{1}{2}$  inch  
Hatch Cutlery Co., Solid Steel Forged,  
60%  
60%

## Heinisch's, list Dec. '81.....60%

Heinisch's Tailors' Shears.....33 $\frac{1}{2}$ ¢  
Howe Bros. & Hulbert, Solid Forged  
Steel.....40%  
Seymour's, list Dec. '81.....60%  
Victor Cast Shears.....75%

## Tinners' Snips—

Cast Hand, Laid with Steel.....20%  
Niagara Snips and Shears.....20%  
Steel Laid, Claus.....70%  
Wrt Handles, Steel Blades.....20%  
10%

## Pruning Shears and Hooks

Disston's Combined Pruning Hook  
and Saw,  $\frac{1}{2}$  doz. \$18.00.....25%  
Disston's Pruning Hook,  $\frac{1}{2}$  doz. \$12.00  
25%  
25%  
10%

Dunlap's Saw and Chisel,  $\frac{1}{2}$  doz. \$8.50, 30¢  
Eagle Pruning Shears.....50%  
Henry's Pruning Shears..... $\frac{1}{2}$  doz. \$4.00 @ \$4.25

## Henry's Tree Pruner.....50% Levin Pruner No. 1, \$15.00 $\frac{1}{2}$ doz. 40% Levin Pruner No. 2, \$21.00 $\frac{1}{2}$ doz. 40% J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25..... $\frac{1}{2}$ doz. \$12.00

No. 100 Pruning Shear.....60%  
Pruning Shears, Henry's Pat.,  $\frac{1}{2}$  doz.  
P. S. & W. Co.....\$2.50@3.25  
P. S. & W. Co.....\$2.50@3.25  
Telegraph Tree Pruner.....60%  
Waters' Tree Pruner.....80%  
Wheeler, M. & C. Co., Combination,  
 $\frac{1}{2}$  doz. \$12.00

## Tinners' &c.—

Shears and Snips (P. S. & W.).....20%  
Snips, J. Mallinson & Co.....33 $\frac{1}{2}$ ¢

## Sheaves—

Corbin's list.....60%  
M. W. Co., list July, '88.....50%  
Moore's Anti-Friction.....50%  
Patent Roller.....60%  
Patent Roller, Hatfield's.....75%  
R. & E., list Dec. 18, '85.....55%  
Russell's Anti-Friction, list Dec. 18, '85,  
80%  
22%

## Silding Shutter—

Reading list.....60%  
R. & E., list Dec. 18, '85.....60%  
Sargent's list.....70%

## Shells—

Brass Shot Shells, Club, Rival, Climax,  
65%  
Brass Shot Shells, 1st quality.....60%  
First quality 4, 8, 10 and 12 gauge  
25%  
First quality Rival, Club and Climax  
brands, 14, 16 and 20 gauge (\$7.50  
list).....20%  
Prize.....40%  
Smokeless brand, 12, 10, 16 gauge  
33 $\frac{1}{2}$ ¢@10%  
Star, Club, Rival and Climax Brands  
33 $\frac{1}{2}$ ¢@10%  
Trap brand 12 and 10 gauge.....33 $\frac{1}{2}$ ¢@10%  
Standard list.....19

## Ship Tools—

L. & I. J. White.....20%  
5%

Covett, New R. E.	60&10&5&2
Fitch's Bristol	50&10&5
Fitch's National	50&10&5
Fitch's Clipper	60&10
Fitch's Union	60&10
Fitch's Champion	50
German, new list	40&10
Kelley & Woolworth's Steel Harness	50&10&60
John Protz Snaps	75&75&5
Sargent's Patent	70&10&10&70&10&10

**Snaths—**

Scythe.....50&amp;2&amp;50&amp;10

**Snips, Tinner's—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spittoons, Cuspidors, &c.**

Standard Fiber Ware—

Cuspidors, 8½-inch, # doz., No. 5, \$8; No. 5x, \$9

Spittoons, Daisy, 8-inch, No. 1, 4, 10 and 11 inch, \$8.

**Spoke Shaves—**

See Shaves, Spoke.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Tinned Iron—

Basting, Cen. Stamp. Co.'s list.....70&amp;25

Buffalo, S. S. &amp; Co.....33&amp;2

Solid Table and Tea, Cen. Stamp. Co.'s list.....70&amp;25

**Silver Plated—**

4 months or 5% cash 30 days:

L. Boardman &amp; Son.....50&amp;19

Holmes &amp; Edwards Silver Co.....40&amp;15

Meriden Brit. Co., Rogers.....40&amp;15

Reed &amp; Barton.....40&amp;40

Rogers &amp; Bros.....40&amp;15

C. Rogers &amp; Bros.....40&amp;15

Rogers &amp; Hamilton.....40&amp;15

Wm. Rogers Mfg. Co.....40&amp;15

Simpson, Hall, Miller &amp; Co.....40&amp;15

**Miscellaneous—**

Bordman's Britannia Spoons, case

lots.....60&amp;5 cash

Boardman's Nickel Silver, list July 1,

91.....60&amp;7

Britannia.....60&amp;6

German Silver.....50&amp;50

Nickel Silver.....50&amp;50

Holmes &amp; Edwards Silver Co.....50&amp;10

No. 24 German Silver.....50&amp;10

No. 30 Silver Metal.....50&amp;10

No. 49 Nickel Silver.....50&amp;10

No. 50 Nickel Silver.....50&amp;5

No. 67 Mexican Silver.....50&amp;10

Rogers &amp; Hamilton:

Clmetar, Flatware.....40&amp;15

Clmetar, Steel Goods.....40&amp;10

Crown Hamilton, Flatware and Cut-

lery.....30

Steel Goods.....40&amp;10

Wm. Rogers Mfg. Co.:

18½ Rogers' German Silver.....60&amp;6

22½ Rogers' Nickel Silver.....60&amp;6

Rogers' Silver Metal.....50&amp;10

**Springs**

Champion (Coll.).....55&amp;10

Cowell's No. 1, # doz. \$18.00; No. 2,

\$15.00.....50&amp;10

Gem (Coll.), list April 19, '86.....20

Hercules.....50&amp;10

Phoenix.....33&amp;39

Rubber, complete, # doz. \$5.50; 60¢

Star (Coll.) list April 19, '86.....20

Torrey's Rod, 39 in., # doz. \$12.00; 25

Warner's No. 1, # doz. \$1.50; No. 2,

\$3.40.....55&amp;55

Victor (Coll.).....60&amp;10

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Half

Scroll.....60&amp;10

Cliff's Bolster Springs.....25

**Sprinklers, Lawn—**

Gibbs' Arc.....# doz. \$12.00

Gibbs' Hustler.....# doz. \$6.00

**Squares—**

Nickel-Plated.....85&amp;55

Steel and Iron.....60&amp;10

Try Square and T Bevels.....50

Avery's Bevel Protractor.....40

Avery's Flush Bevel Squares.....40

Diston's Try Square and T Bevels 50&amp;10

Starrett's Micrometer Caliper Sqrs.....25

Winterbottom's Try and Miter.....30&amp;10

**Squeezers—Fodder—**

Blair's.....# doz. \$2.00

Blair's "Climax".....# doz. \$1.00

**Lemon—**

Porcelain Lined, No. 1, # doz. \$6.00.

Wood, Common.....# doz. \$1.70

Wood, No. 2.....# doz. \$3.00

Dean's, No. 1, # doz. \$6.50; 2, \$3.35; 3,

\$1.65; Queen, \$2.50

Dunlap's Improved, # doz. \$2.75, 20&amp;10

Hotchkiss Straight Flash.....# doz. \$9.80

Jennings' Star.....# doz. \$2.50

Kling.....40&amp;5

Little Giant.....50&amp;50

The Boss.....# doz. \$2.50

**Standard Fiber Ware—**

See Ware, Standard Fiber

**Staples—**

Barbed Blind, ¼ in. and larger, # b 7&amp;7½

Barbed Blind, ¼ in.....# b 8&amp;8½

Fence Staples, Galvanized, # as 7½ Wire

Fence Staples, Plain.....# as 7½ Wire

Grand Crossing Tack Co.'s list.....75&amp;10

**Steels, Butchers'—**

C. &amp; A. Hoffmann's.....40

Nichols Bros.....50

**Steelyards**

40&amp;10

**Stocks and Dies—**

Blacksmith's:

Butterfield's Goods.....35

Waterford Goods.....35

Gardner.....25

Green River.....25

Lightning Screw Plate.....25

Reece's New Screw Plates.....25

Reversible Ratchet.....35

**Stone**

Stones, Grind—See Grindstones.

Scythe Stones—

Pike Mfg. Co., list April, '92.....33&amp;4

Cleveland Stone Co., list Nov. '92, 33&amp;4

**Oil Stones, &c.**

Pike Mfg. Co.:	
Hindustan No. 1, # b.....8¢	
Sand Stone.....40&40	
Turkey Oil Stone, 4 to 5	10¢
in.....80¢	
Turkey Slips.....\$2.00	
Lily White Washita.....60¢	
Rosy Red Washita.....60¢	
Washita Stone, Extra.....50¢	
Washita Stone, No. 1.....30¢	
Washita Stone, No. 2.....30¢	
Lily White Slips.....90¢	
Rosy Red Slips.....90¢	
Washita Slips, Extra.....80¢	
Washita Slips, No. 1.....70¢	
Arkansas Stone, No. 1, 3 to 5 in.....\$2.50	
Arkansas Stone, No. 15½ to 8 in.....\$3.50	
Lake Superior.....# b 13¢	
Lake Superior Slips.....# b 20¢	
Tanite Mills:	
Emery Oil, # doz. \$9.00.....50&65	

**Stops, Bench—**

Cincinnati.....25&10	
Crescent.....# doz. \$1.50	
Hotchkiss' # doz. \$5.....10&10	
McGill's # doz. \$3.....25	
Miller's Falls.....25	
Morrill's.....# doz. No. 1, \$10.00; No. 2,	\$11.00, 40&20
Stearns'.....20&10	
Terrell's Nos. 1 and 2, # doz. \$3; No. 3,	\$3.60.....30
Weston's, No. 1, \$10; No. 2, \$9.25&10&5	

**Stove Polish—See Polish, Stove.****Stretchers, Carpet—**

Cast Iron, Steel Points.....# doz. 75&60	
Cast Steel, Polished.....# doz. \$2.25	
Socket.....# doz. \$1.75	
Bullard's.....25&10	

**Strops, Razor—**

Emerson C. Buff.....# doz. \$2.80	
Imitation Emerson.....# doz. \$1.25	
Jordan's Pat. Padded, list Nov. 1, '89, 50¢	
Lamont Combination.....# doz. \$4.00	

**Stuffer, Sausage—**

Miles' Challenge, # doz. \$20.....50&50	
Perry # doz. No. 1, \$15.00; No. 2,	\$12.00.....50&50
Draw Cut No. 4, each \$30.00.....20	
Enterprise Mfg. Co., list Jan. 17, '93, 25¢	
Silver's.....40&10	

**Sweepers, Carpet and****Lawn—****Carpet—**

Acme.....# doz. \$26.00	
Advance.....# doz. \$18.00	
Grand.....# doz. \$36.00	
Gold Medal.....# doz. \$27.00	
Prize.....# doz. \$27.00	
Premier.....# doz. \$27.00	
Superior.....# doz. \$27.00	
Cosmopolitan.....# doz. \$27.00	
Furniture Protector, Jap.....# doz. \$24.00	
Furniture Protector, Nickel.....# doz. \$27.00	
Into Ocean.....# doz. \$27.00	
Hall.....# doz. \$48.00	
Crown Jewel, No. 1, \$18.00; No. 2,	\$19.00; No. 3, \$20.00.....20
Domestic, No. 1.....# doz. \$21.00	
Domestic, No. 2.....# doz. \$22.00	
Easy Jap'd, # doz. \$22.00; Nickel, \$22.00	
Garland.....# doz. \$18.00	
Gilt Edge.....# doz. \$24.00	
Grand Rapids, Japanned.....# doz. \$24.00	
Grand Rapids, Nickleled.....# doz. \$27.00	
Housewife's Delight.....# doz. \$15.00	
Improvised Parlor Queen,	
J. Nickleled.....# doz. \$24.00	
Ladies' Friend.....# doz. \$27.00	
Ladies' Friend No. 2.....# doz. \$15.00	
Parlor Queen.....# doz. \$24.00	
Standard.....# doz. \$24.00	
Supreme.....# doz. \$22.00	
Embell Carpet Sweeper Co. make the	
following rebates:	
\$1.00 # doz. in 5-doz. lots.	
\$2.00 # doz. in 10-doz. lots.	

**Lawn—**

Thompson Mfg. Co.....30

**Swings—**

Davies Lawn.....25

**Tacks, Brads, &c.—**

List Oct. 19, '89. Old Established

straight Weights. Short Weight goods

are sold at lower prices.

**Carpet Tacks—**

American, Blued.....47½	
American, Tin'd and Cop'd.....52½	
Steel, Bright and Blued.....47½	
Steel, Tinned and Coppered.....52½	
Swedes Iron, S. S., Blued.....40	
Swedes Iron, S. S., Tinned.....40	
American Iron Tacks, Domestic 37½	
American Iron Tacks, Foreign.....50	
Swedes Iron Tacks—	
S. S., Blued.....37½	
S. S., Tinned.....45	
Lanc., Blued.....30	
Lanc., Tinned.....37½	
Upholsterers' S. S.....47½	
Upholsterers', Lanc.....37½	
Gimp Tacks—	
S. S., Blued.....30	
S. S., Tinned.....42½	
Lanc., Blued.....20	
Lanc., Tinned.....35	

**Basket and Trimmers Tacks—**

S. S.....30	
Hungarian Nails.....35	
Common and Patent Brads.....35	
Leathered Tacks.....5	
Brush Tacks and Nails, S. S.....20	
Cooking Glass Tacks, S. S.....5	
Picture Frame Points, S. S.....19	
Lace Tacks Blued.....12½	
Lace Tacks, Tinned.....20	
Finishing Nails.....52½	
Trunk and Clout Nails—	
Black.....52½	
Tinned or Coppered.....57½	
Base Nails.....35	
Chair Nails.....35	
Cigar Box Nails.....30	
Tin Capped Nails.....50	
Shoe Finders' List, Apr. 14, '94.	
F. H. Cobblers' Nails:	
4½-in. and shorter, # 100 b \$20.80	
4 in. and longer, # 100 b, \$18.85	
C. S. Corrugated Brass Nails, or	
Flat Head Improved Brass Nails:	
No. 18 and 19 17 & heavier	
2-8 & 2½-8 in. \$60.00.....\$41.20	
3-8 & 3½-8 in. 51.50.....35.15	
4-8 & longer. 41.20.....35.45	

Extra 33½¢ &amp; 2¢ cash.

Extra 33½¢ &amp; 2¢ cash.

Extra 33½¢ &amp; 2¢ cash.

Extra 33½¢ &amp; 2¢ cash.

Extra 33½¢ &amp; 2¢ cash.

Extra 33½¢ &amp; 2¢ cash.

**Miscellaneous—**

Double Point.....85&10	
Wire Carpet Nails.....85&10	
Bill N.Y. Box.....\$4.00	
Bonnie Blue.....# box \$1.50	
Claw Handle Carpet.....# gr. \$4.00	
Home Tacks, No. 50, # case (12 car-	
tons), \$36.00; No. 100, # case (12	
cartons), \$72.00.....50&2	
Home Nails, No. 200, # case (12 car-	
tons), \$30.00; No. 400, # case (12	
cartons), \$60.00.....50&2	
Parlisan Gift Nails, cartoon.....50	
Plymouth Rock Carpet Tacks.....20	
Upholsterers' Nails.....50&10	

**Wire Brads and Nails—**

Steel-Wire Brads, R. &amp; E. Mfg. Co's list

50&amp;10&amp;10

**Tanks, Oil—**

Emerald, S. S. &amp; Co.: 30-gal. \$8.70; 60-

gal., \$11 each.....50&amp;10&amp;5

**Tapes, Measuring—**

American.....40&10	
Chesterman's, Regular list.....30	
Excelsior, Special list.....20	
Spring.....40	

**Thermometers—**

Tin Case.....80&amp;80

**Thimble Skeins—**

See Skeins.

**Ties, Bale—Steel.**

Standard Wire, list.....50&amp;10&amp;5

**Tinner's Shears, &c.—**

See Shears, Tinner's, &amp;c.

**Tinware—**

Stamped, Japanned and Pieced, list

Jan. 20, '87.....70&amp;10

**Tire Benders, Upsetters,****&c.—See Benders and Upsetters,****Tire.****Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—****Coopers'—**

Albertson Mfg. Co.....25	
Barton's.....20&20	
Beatty's.....33½	
Bradley's.....20	
Sandusky.....30	
Shaves Cincinnati Tool Co.....20	
L. & J. White.....20&5	

**Lumber—**

Cant Hooks, "Blue Line".....# doz. \$16.00

Cant Hooks, Common Finish.....# doz. \$14.00

Cant Hooks, Mall. Socket Clasp, "Blue

Line" Finish.....# doz. \$16.00

Cant Hooks, Mall. Socket Clasp, Com-

Standard Fiber—		Per Doz.
Plain, Decorated.		
Cuspidors.....	\$7.50	
Half-peck Measure.....	\$3.00	
Peck Measure.....	3.50	
Keelers, 11½ in.....	9.00	
Spittoons, Daisy, 3 in. 3.50	4.00	
Wash-Basins, 10½ in.....	1.80	
Wash-Basins, 12 in.....	2.00	
See also <i>Pails</i> .		
Indurated Fiber—		
Basins, Ringed, ½ doz., No. 2.....	1.60	
Butter Bowls, 15, 17 and 19-in (3 pieces), ½ nest.....	\$1.50	
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ½ nest.....	\$2.55	
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), ½ set.....	\$1.20	
Spittoons No. 2, ½ doz.....	\$4.80	
Washbuds, Nested, Nos. 0, 1, 2, and 3 (4 pieces), ½ nest.....	\$5.75	
See also <i>Pails</i> .		
Silver Plated Hollow—		
4 mo., or 5¢ cash in 30 days.		
Meriden Britannia Co.....	40&5¢	
Read & Barton.....		
Whips—		
American Whip Co.: Length.....	4½ 5 5½ 6 6½ 7 7½ 8 ft.	
I. X. L., Whalbone Driving.....	\$18.00 20.00 22.00 24.00 26.00 27.00 30.00 33.00 36.00	
Eureka, Two-thirds Whalbone.....	15.00 16.50 18.00 20.00	
Bull Bone, Half-1/8th Whalbone.....	11.00 12.00 13.00 15.00	
American Standard.....	8.00 8.50 9.50 10.50 12.00 13.50 15.00 16.50	
True Grip, Raw Hide Center.....	6.00 6.00 6.50 7.00 7.50 9.00	
New Name, Stocked Java, Black and White Co.....	6.00	
Americus, 93 Pen Whip.....	6.00	
Gents' Light Driving No. 111.....	6.00	
Gents' Light Driving No. 106.....	5.00	
Hand-Made Stocked Java No. 103.....	3.75 4.00	
A large variety of cheaper grades.....	50¢@83.00	
Team Whips.....	\$2.00@7.50	
Toy Whips.....	5¢ gr. \$2.50@12.00	
Hardware Assortment, 10 American, 75 Whips for \$50.		

## Wire and Wire Goods—Iron

Market:	
Br. ½ Ann., Nos. 0 to 18.....	75&10@80¢
Cop'd, Nos. 0 to 18.....	75&5@75&10&5¢
Galv., Nos. 0 to 18.....	70&10@75¢
Tin'd, Tin'd list, Nos. 0 to 18.....	75&5@75&10¢
Stone, Br. and Ann'd:	
Nos. 16 to 18.....	82½¢
Nos. 19 to 26.....	82½¢@85¢
Nos. 27 to 36.....	82½¢@85¢
Ann'd Wire on Spools.....	80¢
Brass, list April 9, '94.....	40&5¢
Cast Steel Wire.....	50¢
Copper, list Jan. 18, '84.....	40&5¢
Galvanized Fence.....	75&10¢
Mallin's Ann'd & Tin'd on Spools.....	80&5¢
Mallin's Brass & Cop. on Spools.....	50&5¢
Steel Music Wire, 12 to 30, imported.....	60¢@70¢
Stubs' Steel Wire.....	\$8.00 to 2.30¢
Tate's Spooled, Tin'd & Ann'd.....	60&5¢
Tate's Spooled, Cop. and Brass.....	50¢
Thinned Broom Wire, 18 to 21, ½ in. 4½¢	
Wire Clothes Line, see <i>Lines</i> .	
Wire Picture Cord, see <i>Cord</i> .	

## Bright Wire Goods—

Standard list.....90¢@90&amp;15¢

## Wire Cloth and Netting—

Galvanized Wire Netting, 80@80&amp;10&amp;5¢

Painted Screen Cloth, ½ 100 ft. \$1.40@1.45

Wire, Barb—See *Trade Report*.Wire Rope—See *Rope, Wire*.

## Wrenches—

American Adjustable.....40¢@40&amp;10¢

Baxter's.....60¢@60&amp;10¢

Coes' Genuine.....50¢@50&amp;10¢

Coes' "Mechanics".....50&amp;10&amp;5¢

Girard Standard.....65&amp;10¢@70¢

Lamson &amp; Sessions' Engineers'.....60&amp;10¢

## Lamson &amp; Sessions' Standard.....70&amp;10¢

Girard Agricultural.....75&amp;10&amp;10¢

Lamson &amp; Sessions' Agric'l.....80&amp;5¢

W. &amp; B. Diamond.....50¢@50&amp;10¢

Acme, Bright.....40¢@40&amp;5¢

Acme, Nicked.....\$2.50@2.60

Aiken's Pocket (Bright).....60&amp;10¢

Alligator.....39½¢@10¢@40&amp;5¢

Always Ready.....35&amp;5¢

Bemis &amp; Call's:

Adjustable S.....35&amp;5¢

Bridge's Pattern.....30&amp;10¢

Combination Black.....40&amp;10¢

Combination Bright.....40&amp;5¢

Cylinder or Gas Pipe.....45&amp;5¢

Extra Heavy.....45¢

Merrick's Pattern.....45¢

No. 3 Pipe, Bright.....55¢

Bit Wrench, Adj. Tatum's.....25&amp;10¢

Boardman's.....40¢@40&amp;5¢

Cincinnati Brace Wrenches.....25&amp;10¢

Diamond Steel.....55&amp;5¢

Donohue's Engineer.....20&amp;10¢

Ercules.....70¢@70&amp;10¢

Tat's Vise Wrench.....55&amp;10&amp;3¢

Tatum's Brace.....25&amp;10¢

The Favorite Pocket, ½ doz. \$4.....40¢@40&amp;5¢

Walker's.....55&amp;5¢

Webster's Pat. Combination.....25¢

## Wringers, Clothes—

In lots of less than one dozen.

Am. Wringer Co.'s list, July 2, '94, 2¢

Colby Wringer Co., list May 1, '94, 2¢

Lorel Mfg. Co., list July 2, '94, 2¢

Peerless Mfg. Co., list Feb. '92, 2¢

National Wringer &amp; Mfg. Co., list June 1, '92, 2¢

## Wrought Goods—

Staples, Hooks, &amp;c., list March 17, '92, 85&amp;25¢@90¢

## PAINTS, OILS AND COLORS Wholesale Prices.

White Lead, Zinc, &c.	
Lead, Eng., B.B. white.....	5¼@ 5½
Lead, Am., White.....	4 @ 4½
Dry.....	5¼@ 5½
In Oil.....	5¼@ 5½
Lead, White, in oil, 25 lb tin.....	@ ½
pails, add to keg price.....	@ ½
Lead, White, in oil, 12½ lb tin.....	@ 1
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb as sorted tins, add to keg price.....	@ 2½
Zinc, American, dry.....	3½@ 4½
Zinc, French, Red Seal.....	7 @ 7½
Zinc, French, Green Seal.....	8¼@ 9
Zinc, French, V. M. X.....	6 @ 6½
Zinc, Antwerp, Red Seal.....	6½@ 7½
Zinc, Antwerp, Green Seal.....	6½@ 7½
Zinc, German, L. Z. O.....	5 @
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10¼@ ..
lots less than 1 ton.....	11 @ ..
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over.....	9¼@ ..
lots less than 1 ton.....	10¼@ ..
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%. No discount allowed on less than bbl. lots.	
Dry Colors.	
Blue, Celestial.....	½ lb @ 8
Blue, Chinese.....	40 @ 50
Blue, Prussian.....	25 @ 40
Blue, Ultramarine.....	8 @ 25
Brown, Spanish.....	1 @
Brown, Vandyke, Amer.....	3 @ 3½
Brown, Vandyke, English.....	6 @ 8
Carmine, No. 40, in bulk.....	\$2.00@ ..
Carmine, No. 40, in bxs. or bbls. 2.10@ ..	
Carmine, No. 40, in ounce bot. 3.00@ ..	
Green, Paris, in bulk.....	@ 23
Green, Paris, 170@ 175 lb kegs.....	@ 23½
Green, Paris, small pack.....	25 @ 29½
REBATES—3¢ ½ lb on lots of 10,000 lb or over; 2½¢ on 4000 to 10,000 lb; 2¢ on 2000 to 4000 lb; 1½¢ on 1000 to 2000 lb; 1¢ on 500 to 1000 lb purchased during the season	
Green, Chrome, pure.....	22 @ 25
Lead, Red, bbls. and ½ bbls.....	4½@ 5
Lead, Red, kegs.....	5 @ 5½
Litharge, kegs.....	4½@ ..
Litharge, bbls. and ½ bbls.....	5 @ ..
Ocher, Rochelle.....	1.35¢ @ 1½
Ocher, French Washed.....	1½¢ @ 3
Ocher, German Washed.....	1½¢ @ 3
Ocher, American.....	1½¢ @ 1½
Orange Mineral, English.....	7½¢ @ 8
Orange Mineral, French.....	10 @ 10½
Orange Mineral, German.....	7½¢ @ 8
Orange Mineral, American.....	7½¢ @ 8
Ocher, French Washed.....	5 @ 5½
Red, Indian, American.....	2 @ 5
Red, Turkey.....	9 @ 14
Red, Tuscan.....	7 @ 10
Red, Venetian, Amer.....	100 lb 70 @ 1.00
Red, Venetian, English.....	1.10@1.35
Sienna, Italian, Burnt and Powder.....	4 @ 5
Sienna, Ital., Burnt, Lumps.....	1¼@ 3½
Sienna, Ital., Raw, Powd.....	4½@ 5½
Sienna, Ital., Raw, Lumps.....	1¼@ 3½
Sienna, American, Raw.....	1½ @ 1¾
Sienna, American, Burnt and Powder.....	1½¢ @ 1¾
Talc, American.....	1 @ 1½
Terra Alba, French, ½ 100 lb.....	65 @ 75
Terra Alba, English.....	65 @ 75
Terra Alba, American No. 1.....	65 @ 75
Terra Alba, American No. 2.....	45 @ 50
Umber, Turkey, Bnt. & Pow. ½ lb.....	2½@ 3
Umber, Turkey, Raw & Powd.....	2½@ 3
Umber, Turkey, Raw, Lumps.....	2¼@ 2½
Umber, Turkey, Bnt. Amer.....	1¼@ 1½
Umber, Turkey, Raw, Amer.....	1¼@ 1½
Yellow, Chrome.....	10 @ 25
Vermilion, American Lead.....	11 @ 12
Vermilion, Quicksilver, bulk.....	58 @ 12
Vermilion, Quicksilver, bags.....	59 @
Vermilion, Quicksilver, sm'r pkgs.....	63 @ 65
Vermilion, English, Import.....	60 @ 65
Vermilion, Imitation Eng.....	8 @ 30
Vermilion, Trieste.....	90 @ 95
Vermilion, Chinese.....	35 @ 1.00
Paints in Oil.	
Black, Drop, Frankfort.....	25 @ 30
Black, Drop, English.....	12 @ 15
Black, Drop, Domestic.....	7 @ 10
Black, Lamplack, Best.....	20 @ 35
Black, Lamplack, Common.....	7 @ 13
Black, Ivory.....	8 @ 15
Blue, Chinese.....	95 @ 40
Blue, Prussian.....	20 @ 45
Blue, Ultramarine.....	12 @ 18
Brown, Vandyke.....	7 @ 12
Green, Chrome.....	8 @ 13
Green, Paris.....	16 @ 18½
Stenna, Raw.....	7 @ 14
Sienna, Burnt.....	7 @ 10
Umber, Raw.....	7 @ 10
Umber, Burnt.....	7 @ 10
Miscellaneous.	
Barytes, Foreign, ½ ton.....	\$22.00@24.00
Barytes, Amer. floated.....	29.00@32.00
Barytes, Amer. No. 1.....	16.00@18.00
Barytes, Amer. No. 2.....	13.00@15.00
Barytes, Amer. No. 3.....	11.00@12.00
Chalk, in bulk.....	½ ton 1.75@ 2.00
Chalk, in bbls.....	½ ton 33¢ 40
China Clay, English.....	½ ton 13.00@18.00
Chalk, Oxide.....	½ ton 1.45@ 1.85
Whiting, Common.....	½ 100 lb 40¢ 45
Whiting, Gliders.....	50¢ @ 55
Putty.	
In barrels and ½ bbls.....	13¢@ 13½
In tubs.....	14¢@ 14½
In tin cans.....	14¢@ 15
In bladders.....	15¢ @ 2
Spirits Turpentine.	
In regular bbls.....	@ 28½
In machine bbls.....	@ 29
Glue.	
Low Grade.....	½ lb 7 @ 9
Cabinet White.....	11 @ 13
Medial White.....	12 @ 14
Extra White.....	16 @ 20
French.....	10 @ 22
Irish.....	10 @ 12½
Animal and Vegetable Oils	
Linsed, City, Raw.....	½ gal. 56 @ ..
Linsed, City, boiled.....	59 @ ..
Linsed, Western, raw.....	54 @ 55
Lard, City, Extra Winter.....	57 @ ..
Lard, City, Prime.....	56 @ ..
Lard, City, Extra No. 1.....	@ 48
Lard, City, No. 1.....	@ 45
Lard, Western, prime.....	56 @
Cotton-seed, Crude, prime.....	25 @
Cotton-seed, Crude, off grades.....	@ 24
Cotton-seed, Summer Yellow, prime.....	31 @ 32
Cotton-seed, Summer Yellow, off grades.....	28 @ 29
Sperm, Crude.....	57 @ 58
Sperm, Natural Spring.....	55 @ 56
Sperm, Bleached Spring.....	60 @ 61
Sperm, Natural Winter.....	62 @ 63
Sperm, Bleached Winter.....	67 @ 68
Whale, Crude.....	32 @ 33
Whale, Natural Winter.....	41 @ 42
Whale, Bleached Winter.....	43 @ 44
Whale, Extra Bleached.....	46 @ 47
Sea Elephant, Bleached Winter.....	48 @ 50
Menhaden, Crude, Sound.....	22 @ 23
Menhaden, Crude, Southern.....	@
Menhaden, Light Pressed.....	25 @ 26
Menhaden, Bleached Winter.....	32 @ 34
Menhaden, Extra Bleached.....	35 @ 36
Tallow, City, prime.....	51 @ 52
Tallow, Western, prime.....	50 @
Cocanut, Ceylon.....	5¼@ 5½
Cocanut, Coch.....	6 @ 6½
Cod, Domestic.....	28 @ 30
Cod, Foreign.....	30 @ 32
Red Elaine.....	35 @ 38
Red Saponified.....	½ lb 49¢ @ ..
Bank.....	½ gal. 24 @ 25
Straits.....	25 @ 26
Olive, Italian, bbls.....	56 @ 58
Neatsfoot, prime.....	60 @ 62
Palm, prime, Lagos.....	½ lb 5 @ 5½
Mineral Oils.	
Black, 29 gravity, 25 @ 30 cold test.....	½ gal. 69¢@ 7¼
Black, 29 gravity, 15 cold test.....	7 @ 8
Black summer.....	59¢@ 6¼
Cylinder, light filtered.....	12 @ 20
Cylinder, dark filtered.....	10 @ 15
Paraffine, 23½@ 24 gravity.....	11 @ 12
Paraffine, 24 gravity.....	9¼@ 10¼
Paraffine, 28 gravity.....	7¼@ 7¾
Paraffine, red.....	9¼@ 10¼

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